APRIL 14, 1997 VOLUME 14, NUMBER 15

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

WE'VE GOT TROUBLE.

1997 Network Management Survey Page 51.

Growing pains and other challenges

The IETF tries to cope with more members, more standards and more vendors.

By Chris Nerney

FOCUS ON IETF

Second in a two-part series

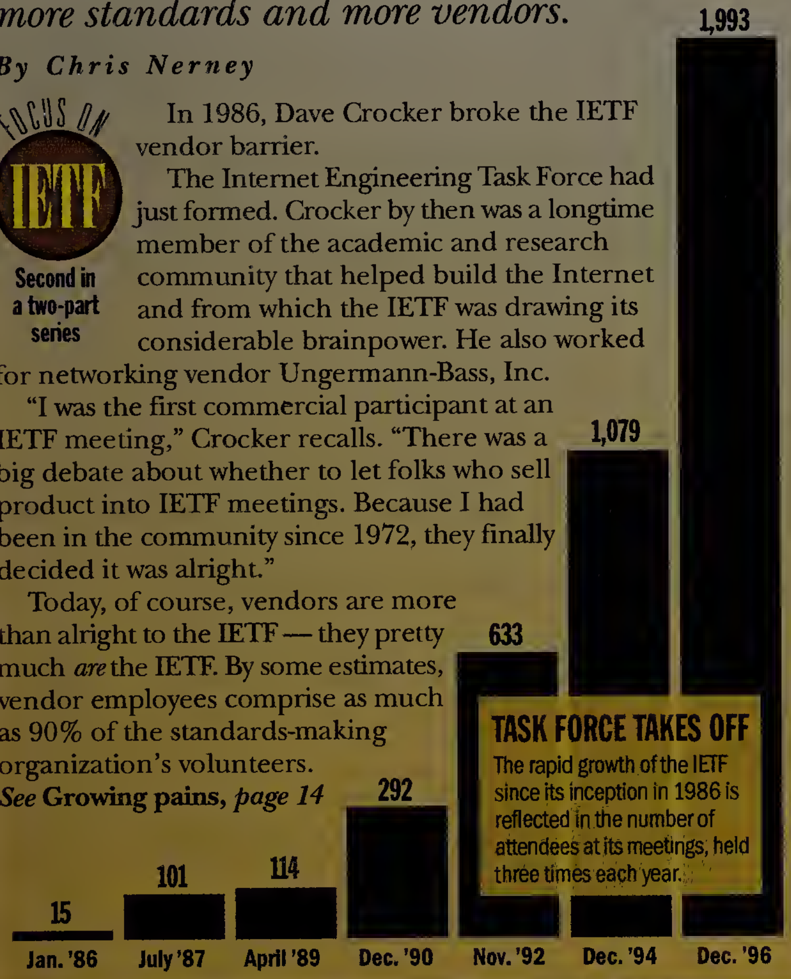
In 1986, Dave Crocker broke the IETF vendor barrier.

The Internet Engineering Task Force had just formed. Crocker by then was a longtime member of the academic and research community that helped build the Internet and from which the IETF was drawing its considerable brainpower. He also worked for networking vendor Ungermann-Bass, Inc.

"I was the first commercial participant at an IETF meeting," Crocker recalls. "There was a big debate about whether to let folks who sell product into IETF meetings. Because I had been in the community since 1972, they finally decided it was alright."

Today, of course, vendors are more than alright to the IETF — they pretty much *are* the IETF. By some estimates, vendor employees comprise as much as 90% of the standards-making organization's volunteers.

See **Growing pains,** *page 14*



TASK FORCE TAKES OFF

The rapid growth of the IETF since its inception in 1986 is reflected in the number of attendees at its meetings, held three times each year.

IETF floats plan to speed up Internet

By Todd Wallack

Memphis, Tenn.

Speeding access to an overburdened Internet is part of a unique new service proposed at the Internet Engineering Task Force (IETF) meeting last week.

With the proliferation of similar Web sites, caching and mirrored sites, files already often exist in several places across the 'Net. It is just that users have no way of being directed toward the nearest site.

The proposed service, called Host Proximity Service (HOPS), however, would direct user requests to the nearest 'Net host.

Improving 'Net performance is just one of the many issues, such as security, netiquette and year 2000 issues, that the IETF is dealing with as it molds the Internet for the future.

HOPS is intriguing because finding the closest host could speed up access and lighten traffic on the Internet, said Paul Francis, a researcher with NTT Software Labs in Japan.

Francis said boxes designated as HOPS servers would keep a list of IP addresses and resources, and upon a client request would calculate the distance between the client and multiple host resources, and then direct the

See **IETF,** *page 14*

IETF MEETING MINUTES

- **HOPS servers** Attendees talked about building a system to find the nearest mirrored site or cache to cut down on network traffic.
- **RSVP** Shows promise but isn't ready for prime time.
- **RFCs** Could the RFC system become history? Some say the Internet tradition is too complicated.
- **Spam** It's bad. Don't do it.
- **Numbering** Plans to create a new registry for doling out blocks of IP numbers were put on hold after the White House said the whole issue needs some study first.

Tool lets ISPs charge for fax, voice

By Denise Pappalardo

Watch out corporate America, your Internet service provider may soon start charging for applications that today are free.

NetCentric Corp. and Compaq Computer Corp. last week announced a new protocol, Metered Services Information Exchange (MSIX), which will let ISPs charge customers extra for applications such as fax, video and voice, said Paul MacKay, president of NetCentric in Cambridge, Mass. ISPs can also use the protocol to bill users when they access specific sites, such as an Internet mall or a daily newspaper site. Software is already being designed to support MSIX.

ISPs, some of which are struggling, are intrigued by the new

See **MSIX,** *page 16*

Cisco unlocks two new security servers

By Jim Duffy

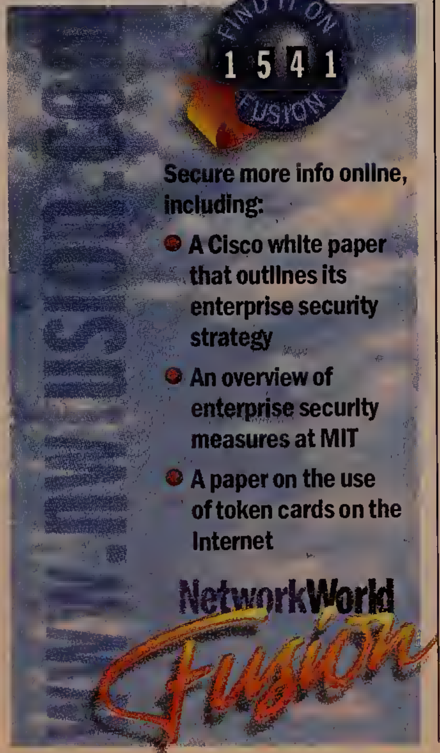
San Jose, Calif.

Cisco Systems, Inc. this week will deliver the first products under its new multivendor security initiative designed to protect enterprise nets from intrusion.

Cisco will announce and ship CiscoSecure Access Control Server (ACS) 2.0 for Unix and CiscoSecure Easy ACS 1.0, an entry-level access control server for Windows NT environments. In addition to protecting networks from break-ins, the CiscoSecure servers also control firewall access to router configuration files and the Internet.

The products are the first

See **Cisco,** *page 68*



Secure more info online, including:

- A Cisco white paper that outlines its enterprise security strategy
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- A paper on the use of token cards on the Internet

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Access Network World Fusion using the number in yellow. See page 5 for details.

Compaq buys into remote access

The company plans to acquire Microcom for $280 million, addressing a top technology priority for Compaq, said Senior VP Alan Lutz. See page 6.

A peek inside frame relay cloud

By Tim Greene

Imagine negotiating a service level agreement (SLA) for your frame relay network, then never checking whether the carrier actually met it.

That is exactly the case in many frame relay networks because it is just too hard to get the information needed to get a solid look at performance.

"We've no way of measuring it. We're deficient," admitted Jim McDonnell, systems manager for Rock-Tenn Co., a manufacturing firm in Norcross, Ga. The company has to take it on faith that its frame relay provider, Cable & Wireless, Inc., is performing up-to-snuff.

But now some long-distance

See **Service,** *page 69*

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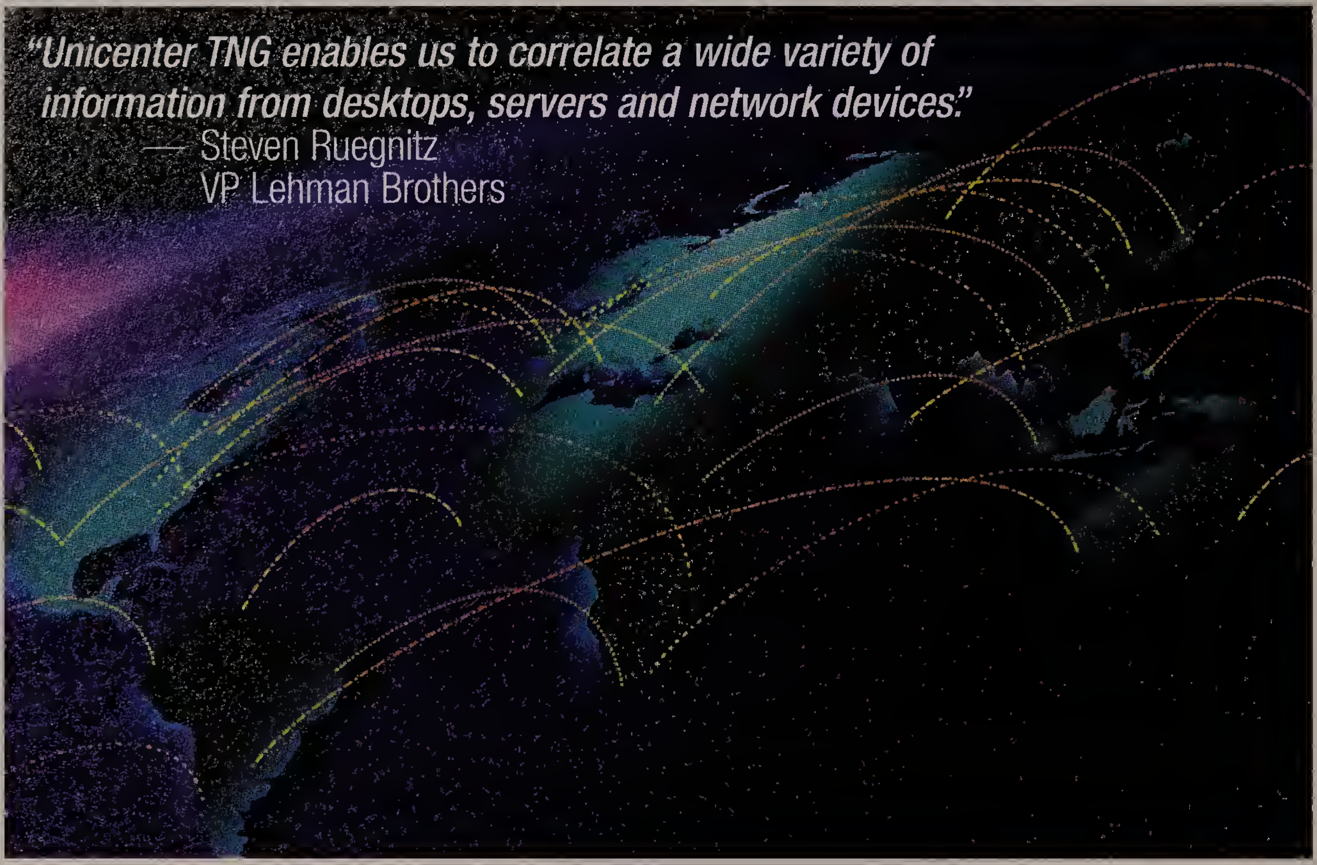

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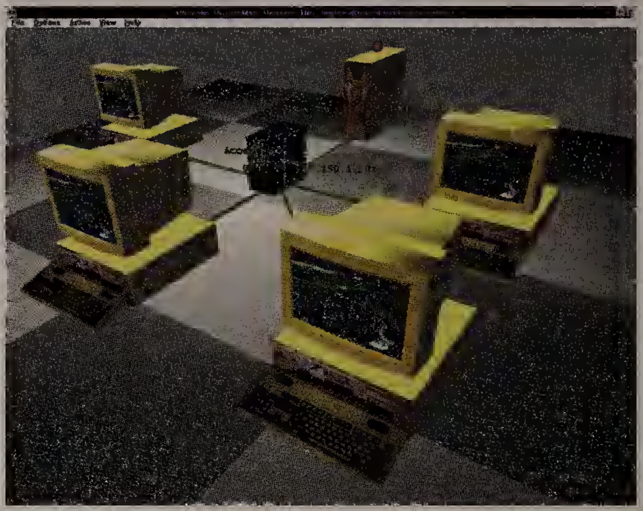

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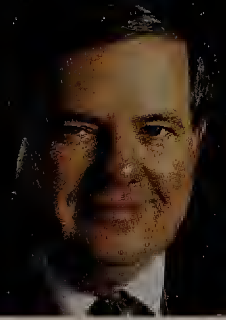
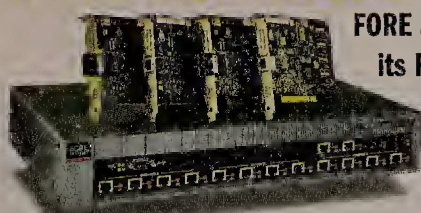


SUN USES OWN STUFF

CIO Raducel heads internal Java push; execs already up and running. Page 37.

ATM FOR LESS DOUGH



FORE attempts to make its ForeRunnerLE 155 ATM switch affordable even for LANs. Page 10.

DID NT KILL THE UNIX STAR?

HP's Dick Watts says Unix will always have a place in enterprise nets. Page 32.

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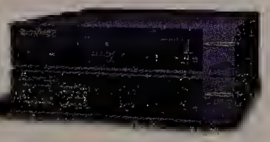

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Most products merely plug holes while integration and automation problems loom large. Page 51.

REVIEW: VINES 7.0. Banyan's enterprise NOS continues to mature. Page 57.

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World,* enter its DocFinder number in the input box on the home page.

This Week

Only on Fusion

- **New!** This week, we launch an audio primer series with an explanation of asymmetric digital subscriber line (ADSL). Listen to a 4.5-minute overview of how this high-speed technology works and what needs to be done to move it out of the trial stage. Then follow our links for more information and the latest ADSL news. You'll need a RealAudio client, which is downloadable from our primer page. **DocFinder: 1544**
- **Internet.** MCI and BT last week signed a deal with Japanese telecom giant NTT for a global roaming service that will let users gain easy 'Net access as they travel across the U.S., Europe and Japan. **DocFinder: 1545**
- **Electronic commerce.** IBM says it will make its MQSeries messaging middleware easier to use as it attempts to convince users it can become the heart of sophisticated electronic commerce applications. **DocFinder: 1546**
- **Client/server.** Sybase last week unveiled ImpactNow, a new architecture aimed at migrating client/server applications to the Internet via Java, ActiveX and a redesigned Sybase database. **DocFinder: 1533**
- **NOSes.** The Santa Cruz Operation is planning new versions of UnixWare and OpenServer that feature a host of Internet-based applications and a clustering module. **DocFinder: 1549**
- **Bandwidth.** MCI is planning new services based on fractal algorithms that promise to dramatically slice the size of files sent over a network. **DocFinder: 1532**

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News briefs, April 14, 1997

Not SET in stone

■ The Secure Electronic Transaction security protocol is expected to be completed by the end of next month. . .Version 1.0, that is. But last week, Steve Mott, MasterCard International, Inc.'s vice president of electronic commerce, said the group designing SET, which includes Visa International, Inc., Microsoft Corp. and IBM plans, to overhaul SET 1.0 by year-end. "We expect the Kevin Mitnicks of the world will find a way to hack it," Mott said of SET's underlying 56-bit encryption technology supplied by RSA Data Security, Inc. "We expect to see 56-bit cracked within a year."

The group working on SET plans to dump RSA Data Security's technology for Certicom Corp.'s elliptic curve technology, which encrypts data more efficiently even with a longer key length. "RSA was a good starting point. But if we had known elliptic curve was ready, we would have started down the road with that," Mott said.

No end to security flaws, or critics

■ McAfee touched off a security firestorm last week when it disclosed to the media that Norton Utilities 2.0 for Windows 95, made by its competitor Symantec Corp., presented a hostile ActiveX applet security risk when used with Microsoft Internet Explorer 3.X. Web hackers could create a page that, when viewed by Explorer, could perform malicious acts, such as tampering with data or wiping out a hard drive, due to Norton Utilities' support for ActiveX scripting, according to McAfee. Norton acknowledged the security hole and issued a software patch last week.

UUNET's ExtraLink not ready for prime time

■ UUNET Technologies customers waiting for extranet services will have to wait longer than expected. The WorldCom, Inc. subsidiary will not make the service — originally slated for February — available until June, said Jay Jonekait, vice president of extranet service (*NW*, Dec. 16, 1996, page 10). The service was not meeting performance and reliability expectations, Jonekait said. UUNET raised the bar on its service level guarantees when it announced the ExtraLink service would offer users a latency guarantee of 150 msec or less. "We are not willing to accept a second-class service," Jonekait said.

Bay makes IP management buy

■ Bay Networks, Inc. last week signed a definitive agreement to acquire Isotro Network Management, Inc., a privately held vendor of IP address management software, for $11 million. Isotro's technology will form the foundation of Bay's IP Services software. Isotro CEO Rod Anderson will report to Brad Noblet, vice president and general manager of Bay's Router product division, and Isotro's 20 employees will continue to operate under Anderson's leadership in Ottawa.

Netscape pushes back

■ With partners at its side, Netscape Communications Corp. tomorrow will outline its plans for pushing content to end users' desktops through technology code-named Constellation, which will get a new name this week, sources said. The Netscape announcement will serve as a response to rival Microsoft Corp.'s Channel Definition Format (CDF), sources familiar with the plan said. Microsoft proposed the CDF standard, with some 30 allies by its side, at a press conference last month at Internet World. Netscape cofounder Marc Andreessen downplayed the CDF initiative as "unnecessary," saying he thought push-based content could be accomplished with HTML and Java, using HTTP as the core protocol. A special Constellation feature, called the Netscape Channel Finder, will rely on HTML, Java and JavaScript, sources said.

Netscape has been talking to Marimba, Inc., about licensing a set of Java libraries to let Constellation use Marimba's software distribution architecture and give a different look and feel to the user interface, sources said.

Compaq targets the Internet

Compression technology would speed up Web surfing and corporate intranets.

By Sari Kalin
Houston

Promising to speed up surf times on the World-Wide Web and corporate intranets, Compaq Computer Corp. last week announced graphics compression technology for its ProLiant Windows NT servers.

INNOVATE FORUM℠ 97
COMPAQ COMPUTER CORPORATION

Compaq has several such efforts under way to make its servers a more popular choice for Internet infrastructures, Web developers and corporate intranets, said John Rose, senior vice president and group general manager of Compaq's Enterprise Computing Group. The announcement was made during a press briefing before Compaq kicked off its Innovate Forum 97 customer conference.

Compaq Acceleration Server Technology will enable users to view images as much as three times faster and surf the Web two to four times faster than they can without compression technology, Rose and other Compaq officials said. The server-based system, targeted at Internet service providers and corporate intranets, uses real-time wavelet compression to reduce bandwidth needed for HTTP transfers, Rose said.

Here is how Compaq officials said the system will work: Users equipped with a browser plug-in will send a Web page request to an ISP or intranet proxy server running the compression software.

The proxy server will send the request to the Web site. When the page is sent back, the proxy server will compress it and send it to the user, whose browser plug-in will decompress it.

Compaq's John Rose *wants to see the company's servers anchoring the Internet and corporate intranets.*

The proprietary compression software will reside on Compaq ProLiant Windows NT proxy servers, officials said. The server bundle, due out around July, will also include Parallel Digital Signal Processing Array hardware developed by Integrated Computing Engines, a Waltham, Mass.-based company. Pricing is not yet available for the bundle.

PC users equipped with Microsoft Corp.'s Internet Explorer or Netscape Communications Corp.'s Navigator browser will only need a plug-in to decompress the images.

The plug-in will be available free over the Web, initially for Intel-compliant PCs but eventually for other platforms.

In the future, Compaq will focus on similar compression offerings targeted at telephony as well as videoconferencing and streaming.

Kalin is a correspondent with IDG News Service's Boston bureau.

Compaq buys Microcom for $280 million

By Tim Greene
Houston

Compaq Computer Corp. last week bought its way into the remote access market, announcing plans to pick up Microcom, Inc. for $280 million.

Along with the announcement, Compaq revealed ambitious plans to grab customers quickly by pumping Microcom products through Compaq sales channels and improving the price/performance ratio of those products by a factor of two.

"With Compaq's sales channels, I'd go along with that [price savings being attainable]," said Brad Baldwin, an analyst with International Data Corp. in Mountain View, Calif.

Compaq is going right after market leader Ascend Communications, Inc., looking to gain 25% of the remote access server market within a couple of years, according to Alan Lutz, senior vice president and general manager of Compaq's Communication Products Group.

Compaq's road map calls for basing the company's remote access servers on two new Microcom hardware platforms and Windows NT software.

Microcom is well known for its remote control software, Carbon Copy. But the Access Integrator and ISPorte it started shipping in 1996 accounted for a 212% surge in overall Microcom sales between the first and second half of last year, Baldwin said.

The deal also gives Compaq modem technology it can incorporate into its network servers.

Compaq would not detail products that might come from the acquisition.

Compaq is looking to gain 25% of the remote access server market within a couple of years, according to Compaq's Alan Lutz.

While Microcom products perform well, Baldwin said they are pricey. But Compaq claims its ability to buy parts in large volume will reduce manufacturing costs.

In addition, the company intends to cut margins thin to maximize sales. "We will price for accumulation of share — a classic Compaq play," Lutz said.

Mark Galvin, president of RAScom, Inc., which also makes NT remote access servers, said the deal was impressive.

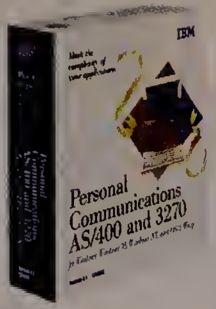
By owning its modem supplier, he said Compaq will cut out the middleman and should be able to keep prices down.

Ariel, too

News of the Compaq/Microcom deal led modem-maker Ariel Corp. to reveal its plans for a remote access product line called RASCAL that the company had planned to keep under wraps until NetWorld+Interop 97 next month.

RASCAL features Netblaster, the code name for a PC board that includes modems and software to convert a standard file server into a remote access server.

The board will offer Compaq rivals the option to quickly market remote access servers, according to John Lynch, chief technical officer at Ariel. ■



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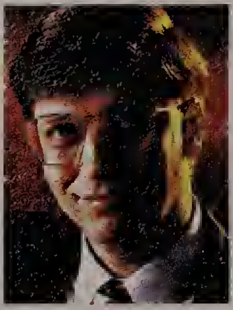
Gates floats idea of Windows terminal

By Christine Burns
San Francisco

Microsoft Corp. Chairman Bill Gates raised some eyebrows last week when he committed to supporting a thin-client architecture that is skinnier than its rival, the network computer (NC).


Gates *snubs Java thin client, touts NT.*

Gates told attendees at the Windows Hardware Engineering Conference here that putting any type of system software on a thin client defeats the purpose of a low-cost, low-maintenance machine because that software will have to be upgraded over the life of the device.

"Anything that has to change every three years is not a thin client," said Gates, adding that Microsoft's Windows terminal is "the only true thin client" because it requires no client-side system software.

The proposed Windows terminal, stripped-down desktop hardware that Microsoft has yet to set specifications or raise industry support for, will not run any operating system software. Instead, the terminal will receive only screen images of Windows applications running on a multiuser version of Windows NT Server, code-named Hydra.

The "video protocol" enabling the Windows screens to be sent from NT Server to the Windows terminal has not been defined either. It is unclear whether it will be a proprietary protocol that works only with Hydra or one that supports other multiuser NT systems such as Citrix Systems, Inc.'s WinFrame.

Gates said the Windows terminal will be a "task-based device," giving traditional dumb terminal users a view of only applications they need.

Angel Cortez, a systems engineer with national retailer Nordstrom, Inc., is concerned about Windows terminals supporting access to NT applications only. "They won't take off if Microsoft expects us to rewrite our mainframe applications for NT in order to use them," Cortez said.

Other users fear their networks will be taxed by the transmission of the Windows screens from NT Server to the Windows terminal.

"What kind of hit is my network going to take with all of these video streams tying up the wire?" asked Rick Shope, manager of PC technology at NationsBanc-CRT in Chicago.

Windows product manager Phil Holden said Microsoft is investigating low-cost alternatives to forcing users to buy new hardware, such as altering low-end PCs to act as Windows terminals.

Microsoft officials would not say when they expect Windows terminals to hit the market.

Torsten Busse, a correspondent with IDG News Service's San Francisco bureau, contributed to this story.

Web-based trouble-ticket, other network management applications on tap from AT&T

By David Rohde
Basking Ridge, N.J.

By the end of the year, AT&T will let users submit trouble tickets over the World-Wide Web, *Network World* has learned.

The move is part of a gradual effort by AT&T to shift some of its management applications to a browser-based interface. Earlier this month, AT&T debuted a browser-based version of the Network Call Attempt Monitor, a call center administrator tool.

"We're looking at the [management applications] that are the simplest to use and with the broadest appeal," said AT&T spokeswoman Karen Way.

Analysts and AT&T officials cautioned that the company is not initiating a wholesale movement of WAN management applications services to the Internet. For example, AT&T currently is not planning to put frame relay circuit analysis reports on the Web, even though two of its major competitors have already done so.

Instead, AT&T will continue to use proprietary management systems or software for SNMP platforms for data-circuit management applications. "We have quite an embedded base there, so we're not going to change everything in a minute," Way said.

The Network Call Attempt Monitor displays the number of calls being made to toll-free numbers and from what locations within minutes after the calls are placed.

Pacific Gas & Electric Co. is now using the Web-based Call Attempt Monitor to manage calling volumes. Using the tool, the company is keeping busy rates below 1% and average speed of answer under 20 seconds, according to Glenn Reece, the utility's director of customer traffic control.

The next AT&T Web-based management applications also will be voice network oriented, but the trouble-ticket application will be the first to cover voice and data networks, Way said (see graphic). WorldCom, Inc. and MCI Communications Corp. have already introduced Web-based frame relay circuit reporting applications.

WorldCom introduced its own homegrown version last fall, while MCI is offering a Web-based version of the Network Health-Frame Relay reporting application from Concord Communications, Inc. ■

TAKING THE WEB-BASED NET MANAGEMENT PLUNGE

AT&T's first five network management products to gain browser access:

Product	Features	Availability
Network Call Attempt Monitor	Real-time data on incoming toll-free calls	Now
Network Traffic Monitor	Traffic engineering data about dedicated trunks	Midyear
Optimize It	Identifies underutilized dedicated access lines	Midyear
AT&T Assurity Reports	Summary outbound call detail within 1-2 days	Midyear
Trouble Tickets	User-requested investigation of network problems	Year-end

Microsoft and Netscape test browser updates

By Carol Sliwa

As rival Netscape Communications Corp. last week launched the third "preview release" of its Communicator browser/groupware client, Microsoft Corp. finally got the first "platform preview" of its new Internet Explorer 4.0 out the door.

But this preview is not intended to be a publicly consumed beta. Microsoft tagged the product with the warning, "Developer Release Only," explaining that the test version is feature incomplete and will not display some Web sites properly.

One important way in which the new Microsoft browser differs from other browsers is in its ability to view anything from Web pages to desktop files through a common interface.

Microsoft had been saying the first beta would be out in March, but the company put off that date in the wake of well-documented problems with its existing browser. The final version, Internet Explorer 4.0, is targeted for summer release.

Meanwhile, Netscape confirmed a second-quarter release of its final Communicator, as the company launched the first feature-complete test version of its new groupware client. Differences between the test and the second preview release include:

- Dynamic HTML improvements, such as support for an enhanced object model and a proposed standard for letting users view a variety of font types.
- An AutoAdmin tool to let managers centrally control client configurations and administer software distribution.
- Support for Secure Multipurpose Internet Mail Extensions and signed objects, which are intended to guard against uncertified Java applications downloaded from the Internet.

Given heightened concerns over security involving Microsoft's ActiveX, Netscape's signed object feature already has become a hot topic.

"Signed objects are probably better than ActiveX, but I'll be skeptical," said Mike Gotta, a senior research analyst with the META Group, Inc. "It still means there's some portion of my machine that's vulnerable."

Netscape's signed object technology will let developers write applications that go outside the Java sandbox model to gain access to a user's hard drive, but only for a targeted purpose.

"Models like ActiveX say that when you want extra capabilities, it's an all-or-nothing thing. You just say yes or no. And if you say yes, it has every capability that you could ever imagine," said Jeff Treuhaft, Netscape's director of security.

In the Netscape model, developers can cryptographically sign a piece of code and specify the capabilities they want the object to have. A user's machine can be configured to accept only objects signed by trusted sources. ■

IBM revs EC server engine

By Ellen Messmer
Atlanta

IBM next month plans to ship the second version of its Internet merchant server, the Net.Commerce server, adding support for the credit and debit card processing standard, Secure Electronic Transaction (SET).

With IBM's SET-enabled server, merchants selling goods on the Internet will be able to take credit card orders from buyers online. And merchants can have the encrypted card information automatically sent to a bank's Internet SET gateway — without having to manually process it for authorization. "SET will make credit cards more secure than in a store," predicted Irving Wladawsky-Berger, general manager of IBM's Internet division.

The Net.Commerce 2.0 server will also have business-to-business features to control access to specific catalog information and pricing. Companies with existing Web sites based on Netscape Communication Corp. servers can build an electronic storefront using Net.Commerce 2.0, which supports Open Database Connectivity for access to databases. ■

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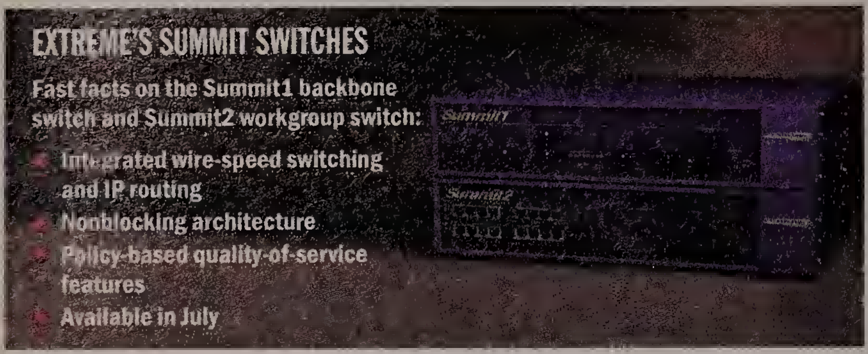
Extreme unveils wire-speed routing/switching device

By Jodi Cohen

Gigabit Ethernet is like gold to the network industry, and there is no question that the rush is on.

Just last week, four vendors — Extreme Networks, Inc., NBase Communications, XLNT Designs, Inc. and Acacia Networks, Inc. — joined the multitude of companies racing to announce Gigabit Ethernet products in time for display at next month's NetWorld+Interop 97 show in Las Vegas.



EXTREME'S SUMMIT SWITCHES

Fast facts on the Summit1 backbone switch and Summit2 workgroup switch:

- Integrated wire-speed switching and IP routing
- Nonblocking architecture
- Policy-based quality-of-service features
- Available in July

The highlight of the foursome was Extreme. The company unveiled a pair of switches that provide wire-speed switching and routing along with policy-based quality-of-service (QoS) capabilities.

"Out of all the Gigabit Ethernet companies that I've seen, [Extreme] really stands out," said Esmerelda Silva, an analyst at International Data Corp. in Framingham, Mass. "In particular, I like that they are doing Layer 3 off the chute and are not starting off with just Layer 2 and then later adding Layer 3 routing modules like some of their competitors."

The company's Summit1 backbone and Summit2 workgroup switches perform wire-speed switching and IP routing at 11.5M packet/sec and 5M packet/sec, respectively. The company's Summit1 and Summit2 switches for the backbone and workgroup, respectively, perform wire-speed switching and IP routing. Summit1 routes 11.5M packet/sec, and Summit2 routes 5M packet/sec, according to Gordon Stitt, president and CEO of Extreme. A typical Cisco Systems, Inc. router offers packet-processing performance of about 1M packet/sec, industry observers said.

Summit1 supports eight Gigabit Ethernet ports and boasts a switching capacity of 17.5G bit/sec, while its little brother, Summit2, provides 16 Fast Ethernet ports, two Gigabit Ethernet uplinks and sports a backplane capacity of 8.5G bit/sec.

The company's switches also include ExtremeWare software to provide policy-based QoS support. The software implements the Re-source Reservation Protocol for bandwidth reservation, Routing Information Protocol for integration with legacy routers, Distance Vector Multicast Routing Protocol and Internet Group Membership Protocol for multicast control and IEEE 802.1p/Q standards for virtual LAN capabilities.

ExtremeWare designates four queues per port on each Summit switch to execute the policies set by the net manager. Pricing is $24,995 for Summit1 and $14,995 for Summit2. They will ship in July.

The rest of the Gig gang

In other Gigabit Ethernet news, NBase this week will unveil a three-slot switch chassis that will support as many as 12 Gigabit Ethernet ports or 48 10M/100M bit/sec Ethernet ports. The device will support the company's DirectIP IP Switching scheme, according to Yechiel Kurtz, vice president of marketing and management at NBase. The switch will ship in the third quarter, but pricing has not yet been set.

Not to be outdone, XLNT this week will announce its Millennium 4000 switch, sources at the company confirmed. The five-slot chassis, which has a 6.4G bit/sec backplane, supports switched Ethernet, Fast Ethernet, Gigabit Ethernet and FDDI links. Pricing has not yet been set, but the product will ship in the third quarter.

Also, Acacia last week unveiled the NovaSwitch 10000gx and the GigaLink 1G bit/sec Ethernet uplink module for the company's existing switches. The NovaSwitch includes 10 Ethernet/Fast Ethernet ports and one Gigabit Ethernet uplink port and is priced at $7,945. The one-port GigaLink module is $2,995. They will ship in July.

© Extreme: (408) 342-0999; NBase: (818) 773-0900; XLNT: (619) 487-9320; and Acacia: (508) 458-7200

Cabletron replaces lost Cisco code with IP Switching

By Jim Duffy
Boston

Cabletron Systems, Inc. last week filled the yawning void in its routing software by licensing IP Switching code from Ipsilon Networks, Inc. as part of a $20 million deal.

For Cabletron, the Ipsilon deal is significant. It is a low-cost, high-performance replacement for the routing code Cisco Systems, Inc. yanked from Cabletron last year, analysts said (*NW*, Oct. 14, 1996, page 1). Cisco terminated Cabletron's Internetwork Operating System license due to alleged unprofessional marketing tactics.

Ipsilon's software supports Cisco's Interior Gateway Routing Protocol, making it compatible with the installed base of Cisco routers, including the Cisco modules described as "power-sucking aliens" inside Cabletron switches and hubs (*NW*, Oct. 21, 1996, page 9).

Though Cabletron claimed Cisco compatibility was not the primary motivation for allying with Ipsilon, analysts said it played a significant role.

"With a lack of Cisco technology, Cabletron had to find some product or vendor to partner with," said Fred McClimans, president of the Current Analysis consultancy in Herndon, Va.

Whether or not Cisco compatibility drove the deal, Cabletron views the Ipsilon union as significant, otherwise it would not have forked over $20 million for an equity stake in the company.

Here's the deal

- **Cabletron purchases a $20 million stake in Ipsilon.**
- **Cabletron will port IP Switching to Smart switches for Internet connectivity.**
- **Ipsilon will integrate Cabletron policy and accounting protocol into IP Switching software.**
- **The two companies will enhance Spectrum with IP Switching management capabilities.**

In addition to $20 million, Ipsilon gets help from a 1,000-person sales force and a major endorsement from a leading, well-established networking company.

Under the terms of the deal, Cabletron will port Ipsilon IP Switching technology to its SecureFast Smart switches for Internet connectivity.

Although Cabletron's SecureFast Virtual Networking (SFVN) software already supports Layer 3 switching, it does not include routing protocols for establishing interdomain connectivity. SFVN will be used for high-speed intradomain connections between desktops and data centers, and Ipsilon's routing protocols will link SFVN domains.

For its part, Ipsilon will integrate Cabletron's Lightweight Flow Admission Protocol (LFAP) into its IP Switching software. LFAP is a messaging protocol exchanged by switches and adapters for establishing user policies for flow-to-circuit mapping and accounting.

Ipsilon will also work with Cabletron to build support for IP Switching management into Cabletron's Spectrum platform.

The companies plan to demonstrate results of their IP Switching work at next month's NetWorld+Interop 97 show in Las Vegas. ■

Fore breaks $1,000-per-seat price for ATM

By Jodi Cohen
Pittsburgh

Think ATM is still too expensive for LAN workgroups?

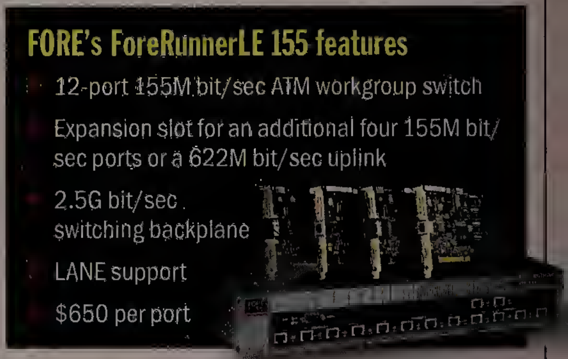
To prove that thinking wrong, FORE Systems, Inc. last week reduced the cost-per-ATM connection by almost 50% when it rolled out a 155M bit/sec ATM switch and adapter that together cost about $1,000 per seat.

The company's ForeRunnerLE 155 switch is priced at $650 per port along with a 155M bit/sec ATM adapter for $300. Previously, FORE offered its ASX 200WG ATM device for more than $1,300 per port, with ATM adapters costing in excess of $600.

"Breaking the $1,000-per-seat price point is key — it's what I've been waiting for on ATM," said Esmerelda Silva, an analyst at International Data Corp., a market research firm in Framingham, Mass.

More on ForeRunner

FORE's ForeRunnerLE is a 12-port 155M bit/sec ATM switch that can be used to provide direct desktop ATM connectivity or as a LAN edge device for linking workgroups to an ATM backbone. The switch boasts a backplane capacity of 2.5G bit/sec and offers an expansion slot for four 155M bit/sec ports or one 622M bit/sec uplink. The high-speed OC-12 uplink costs $3,000, which is about the same price as emerging Gigabit Ethernet switch ports.



FORE's ForeRunnerLE 155 features

- 12-port 155M bit/sec ATM workgroup switch
- Expansion slot for an additional four 155M bit/sec ports or a 622M bit/sec uplink
- 2.5G bit/sec switching backplane
- LANE support
- $650 per port

The ForeRunnerLE supports LAN Emulation services for both Ethernet and token-ring LANs, as well as User-Network Interface 3.0/3.1 and Private Network-to-Network Interface signaling specifications from the ATM Forum.

In addition, FORE incorporated into the switch Explicit Rate available bit rate flow control along with other bandwidth management features, such as large buffers.

The ForeRunnerLE 155 ATM switch and adapter are available now, and the 622M bit/sec ATM interface will ship this summer.

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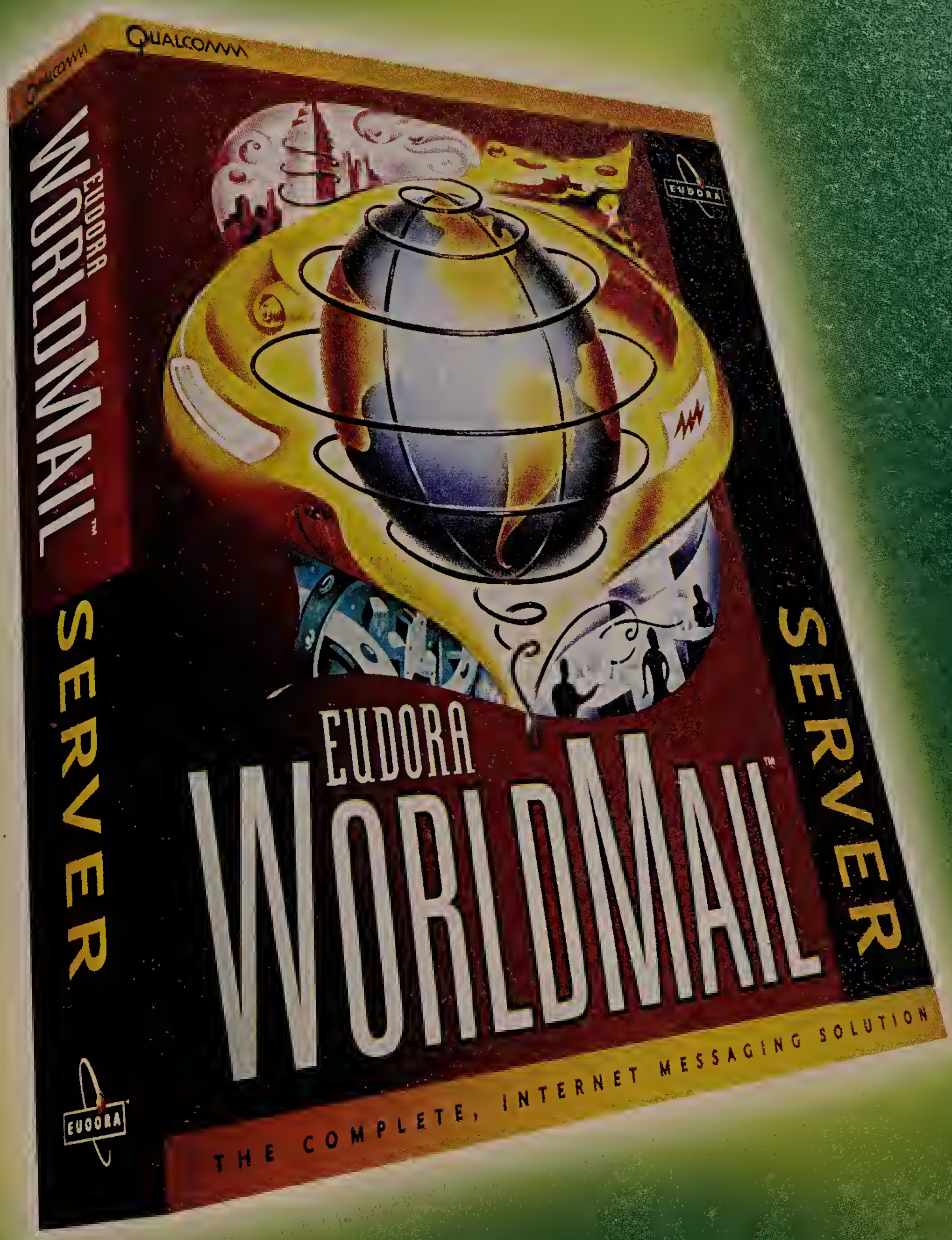

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QUALCOMM

Business-to-business messaging

Users formulate electronic commerce demands

By Paul McNamara
Philadelphia

Cranking up the electronic commerce voltage depends in large part on vendors dialing down their competitive juices in favor of a more cooperative quest for interoperable products and standards.

This key consensus emerged from last week's "EC Thinking Expedition" at the Electronic Messaging Association's (EMA) annual conference here.

Participants from major corporations, such as Exxon Corp., Texaco, Inc. and American Express Co., spent hours pooling their expertise and creating visions of electronic commerce nirvana. Fruits of their labor, which began with a February meeting in Tucson, Ariz., will be featured at the User-Provider Electronic Commerce Summit on Sept. 24 to 26 in San Jose, Calif. A request for proposal is expected to follow that will seek a vendor interoperability demonstration at EMA's spring 1998 conference.

The undertaking may be embryonic — and not devoid of skeptics — but these electronic commerce advocates have already outlined their wish list, which includes:

- Secure E-mail that can be sent quickly and easily across companies. Today, they say, it is an either/or endeavor.
- Full collaborative capabilities among employees of different companies, such as discussion threads, group editing, calendaring and scheduling.
- Dramatically reduced expenses on electronic data interchange so everyday work, such as invoices and purchase orders, can be cost-effectively weaned off paper.

"Every large company and most of the smaller companies that I talk to today are looking for off-the-shelf solutions," said Durwin Sharp, electronic commerce adviser at Exxon Computing Services Co. in Houston.

"We have been hassling and fighting interoperability struggles for so long that we're tired of supporting this stuff," he said.

"I have the same kinds of collaborative requirements with my joint-venture partners as I have with my customers and suppliers — and that's an inter-enterprise problem," he said. "Once it hits a firewall or a gateway you get a really serious lowest common denominator effect."

The electronic commerce advocates are unsure at this point as to whether it makes more sense to push vendors for better versions of existing products or to lobby for mold-breaking solutions and standards, Sharp said.

The ends are more important than the means, said several conference participants.

"[EDI] has to become much easier and cheaper than it is," said Betty Zimmerman, messaging manager for Texaco, and an organizer of the "EC Thinking Expedition."

"The intriguing part will be if we can begin to merge the speed and flexibility of the Web with the volumes that EDI can handle," she said.

What do the vendors stand to gain from making their products work with those of their competitors?

"There are a lot of things I don't deploy — that I don't spend money on — because it's too difficult to get it to interoperate with stuff," Sharp said. "Every dollar that I have to spend internally to get something to connect is at least a dollar that I won't have to spend on product."

One vendor has mixed feelings about where this effort may lead.

"It's a healthy dialogue," said Stephen Layne, general manager of SoftSwitch, a division of Lotus Development Corp., and an EMA board member.

However, he added, "There are some people who are more impatient than others — there are varying degrees of realism," he said.

"Vendors at the end of the day have to understand not only what [customers] want, but what they are going to buy," he said. "What motivates me as a software vendor more than anything else is a request for proposal."

Sharp believes Layne will get his wish, too.

"As vendors learn more about what we're doing, they will see that there are serious business opportunities here," he said. ■

WHAT MESSAGE WOULD YOU LIKE TO SEND TO VENDORS REGARDING ELECTRONIC COMMERCE?

"Let's get interoperable at a level higher than the current lowest common denominator. For example, let's share attached files through and across firewalls."

"We need interoperable, secure messaging from desktop to desktop."

"Understand that companies can't implement change as fast as vendors develop."

"More integration and collaboration among vendors at the API and standards level."

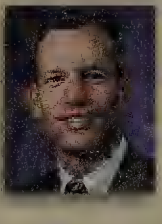
A sampling of responses from E-mail administrators participating in an EMA-led effort to improve electronic commerce.

From geeks to sticky notes

A few random messages from EMA '97, the annual conference of the Electronic Messaging Association:

Fresh off a confidence-boosting BrainShare '97 conference two weeks prior, **Novell, Inc.** took a slap here when it was left off EMA's high-profile "super session" on collaborative computing that featured **Microsoft Corp., Lotus Development Corp.** and **Netscape Communications Corp.** honchos.

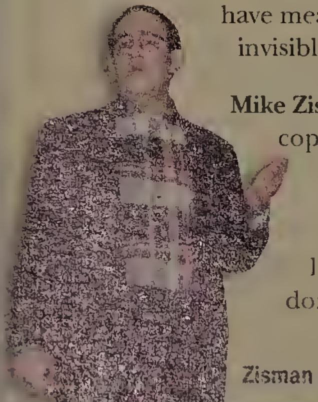
"We do feel like we should have been there [on stage]," groused **Eldon Greenwood,** director of product management at Novell. The snub typifies "that never-ending struggle to keep GroupWise on the shortlist," he added. EMA's response: Sorry, no offense intended.


Greenwood

In a convention hall crammed with the latest in E-mail wizardry and wizards, how do you suppose this message — "James Latham. Important. Call Clarice in your office." — was transmitted to Mr. Latham? A **sticky note** on an old-fashioned bulletin board, of course. No technology show dares do without 'em.

Speaking of unintended, the executive who uttered this gem at an event trumpeting **Business Quality Messaging** couldn't possibly have meant what he said: "Users want to see more invisible integration." Will they need to squint?

Mike Zisman, a **Lotus** executive vice president, who copped the first-ever EMA lifetime achievement award, can't understand why questions linger about the meshing of IBM and Lotus cultures. "Good geeks like good geeks," he said. "And they don't care what badge they're wearing."


Zisman

— *Compiled by Paul McNamara*

Exchange server storage capacity going up

Microsoft pledges summer beta release of hardware limited store for holding messages.

By Paul McNamara
Philadelphia

Persistent gripes about inadequate message store capacity in Exchange Server 5.0 will soon be a thing of the past, a Microsoft Corp. executive promised customers crammed into a conference room here at last week's EMA '97.

While such pledges have flowed from Microsoft lips before, this one was accompanied by a timetable and word that 1,000 of the software maker's employees are already up and running on the forthcoming roomier server.

"The most controversial capability of the [Exchange] 4.0 and 5.0 products is the perception —and I want to emphasize *perception* — that 16G-byte [capacity] is a problem," said Rob Shurtleff, general manager of Exchange partnership and connectivity. "I don't know of very many customers who have in fact hit it."

Whatever the real-world scope of the problem, Microsoft has fashioned what it is calling a "hardware limited store," which Shurtleff said will "take the last one of those bullets away" from critics who have sniped at Exchange over this issue.

What, according to Microsoft, will be the new store's capacity?

"We're taking it to: 'You can't buy hardware big enough,'" Shurtleff said. "In fact, we can't buy hardware big enough to test it."

The prospect of a store upgrade was received positively by Microsoft customers, albeit with a wait-and-see proviso.

"We've got 1,500 branch sites where they do consumer loans," said Jeff Peltier, manager of distributed platforms for The Associates, an Irving, Texas-based financial services subsidiary of Ford Motor Co.

"We're real interested in the ability to have an Exchange server in a central location and have all the 1,500 clients come back to a central site. So we're kind of worried about the data store," he said.

Peltier said those concerns were "somewhat" allayed by Shurtleff's pronouncement, but because his company will deploy Exchange 5.0 immediately, he remains guarded.

"I just want to make sure that it's going to be an easy migration [when the upgrade is ready]," he said. "We hope [the installation] doesn't take too long. It's got to start Friday night and finish Sunday."

A summer beta is planned, Shurtleff said, with a general release to follow in the second half of the year. ■

CORRECTION

The April 7 Management Strategies article, "Sidestepping the privacy issue," incorrectly identified Integralis, Inc.'s E-mail monitoring software. The correct product name is MIMEsweeper.

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IBM goes global with Web-hosting services

By Denise Pappalardo

Somers, N.Y.

The IBM Global Network last week annouced plans to expand its Internet service offering by delivering multinational Web-hosting and high-speed dial-up access.

The IBM Global Network is playing a bit of catch-up in the Web-hosting market, where rival Internet service providers such as PSINet, Inc. and UUNET Technologies have already rolled out international services.

THE WEB HOST WITH THE MOST? IBM

IBM Global Network will offer the following Web-hosting services on Unix and Windows NT servers:

Service	Setup fee	Monthly fee
Standard	$1,200	$495
Professional	$3,000	$2,600 to $3,400
Professional DB	$3,500	$3,100 to $3,900
Custom	Depends on configuration	Depends on configuration

IBM's offerings, based on dedicated or shared Windows NT and Unix servers, will be available in four varieties: Standard, Professional, Professional DB and Custom (see graphic).

The Standard package offers customers a shared server with 2G bytes of storage space. The Professional and Professional DB services are based on dedicated servers and include encryption and authentication capabilities; Professional DB features additional disk storage and memory options. IBM will work with customers to meet their specific security, storage and bandwidth needs with its Custom service.

The services are available now domestically and will be offered in Canada, Europe and Japan by the end of June.

"This is something they should have been doing already, but it's good that they are getting into Web hosting now," said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consultancy.

Separately, IBM has extended its dial-up Internet access offerings beyond 28.8K bit/sec.

New offerings include ISDN Basic Rate Interface, 56K bit/sec analog and Dual Access, a part of IBM's virtual private net service that lets users access the 'Net and their corporate intranet via the same line.

All three dial-up services are available for $3.50 per hour.

ⒸIBM: (800) 426-3333

ANS commits to EC

ANS Communications, an America Online, Inc. company, last week announced it has added an electronic commerce component to its Web-hosting service.

The electronic commerce service, being developed in conjunction with Hewlett-Packard Co. and Connect, Inc., will free customers from training internal technical staffers and installing new software and servers. But it will come at a hefty price — $10,000 to $13,500 per month for starters.

Mitch Ferro, general manager for Web services at ANS, said the service will be worth it. ANS will provide around-the-clock monitoring, access to financial institutions for credit card authorization, as well as systems and database administration. In addition, ANS will offer daily backups and high-speed connectivity to its Reston, Va., Web-hosting facility, Ferro said.

The service, which will be available in May, will run on HP 9000 Enterprise Servers running Connect OrderStream software.

— Denise Pappalardo

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Growing pains

Continued from page 1

Given those odds, it's not surprising that vendor employees also occupy key positions of leadership: IETF Chair Fred Baker is a senior engineer at Cisco Systems, Inc.

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Former longtime chair Phill Gross worked at Advanced Network Services, Inc. and now works for @Home Network. Many of the area directors — who, with the chair, make the decisions on which specifications become industry standards — also are employed by commercial entities.

All of which raises legitimate concerns about vendors influencing standards for their own commercial gain and to the detriment of the Internet community.

Baker himself came under fire earlier this year when Ipsilon Networks, Inc. of Palo Alto, Calif., accused him of trying to delay adoption of a switching standard until Cisco finished a Tag Switching design that would compete with Ipsilon's existing product. Baker denied using his role as IETF chair to forward Cisco's agenda, and veterans of the organization defended him.

Other large vendors also are suspected of wielding undue influence over the IETF standards process.

Among them, IBM, Microsoft Corp., Cisco, Bay Networks, Inc. and Sun Microsystems, Inc. send a couple hundred representatives to the IETF meetings held three times each year. And it has been said that Microsoft has made job offers to every IETF area director.

NetworkWorld Fusion 1541

Find more info online.

- **Other proposals for Internet-based caching schemes.**
- **A roundup of IETF news from the meeting in Memphis, Tenn.**

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But vendor influence is just one of the challenges facing the Internet standards organization. In phone interviews and on the floor of last week's meeting in Memphis, Tenn., IETF regulars cited the following as additional existing and potential problems for the organization: explosive growth, frivolous standards and government influence.

Expanding at cyberspeed

About one-third of attendees at any given IETF meeting are newcomers. Assimilating these new people into the IETF way, while advancing standards work, is the biggest problem facing the organization, according to several long-standing members.

"A major problem has been that we now have fewer per capita contributors at the meetings," says Mike St. John, who was at the first IETF meeting in January 1986, and since then has missed only two gatherings.

"People come to learn, not to contribute," he said.

Even finding the space to accommodate the number of attendees at IETF meetings is becoming difficult. Last week's gathering in Memphis is a case in point. Many of the working groups drew more than 100 people to their sessions at the Peabody Hotel, a far cry from the day when participants —all of whom knew each other's name — could meet in a small classroom at a university or research center.

"There's a real question of outgrowing facilities," Baker says.

Too much of a good thing

One of the IETF's major strengths — and a safeguard against vendor influence — has been its decentralized structure. Standards requests bubble up from working groups to be considered by the Internet Engineering Steering Group, the IETF's decision-making affiliate.

"We cheapen the process by standardizing every piece of drivel that comes out of a working group," says Knowles.

Now some members say the IETF is so decentralized that certain working groups are pushing meaningless standards.

"We cheapen the process by standardizing every piece of drivel that comes out of a working group," says Steve Knowles, a past area director, during a session last week to discuss the standards process.

"We approved a thousand standards, and only about a dozen of them were truly important," he says.

Big Brother's shadow

IETFers are inherently anti-authoritarian, taking a dim view of government efforts to censor or otherwise assert control over the Internet. Even if such actions do not affect the standards process directly, IETF members say they will fight for a free cyberspace.

"The Internet is the largest functioning anarchy in the world," says Gary Malkin, who cowrote *The Tao of the IETF,* an online primer for newcomers.

"We're doing anything we can to prevent the government from ever trying to regulate us in any way, because that would be the end of everything," he says.

Despite the numerous pressures brought to bear on the IETF, participants generally agree that the organization is holding up well.

"There have always been situations where there's dissension," Crocker says. "As things have grown, and as commercial interests have played a bigger factor, the dissension has sometimes gotten worse or more difficult to resolve.

"In spite of that, the core spirit, the core goals and the core style of operations of the IETF have remained constant," he says.

Network World Fusion Senior Writer Todd Wallack contributed to this story from the IETF meeting in Memphis, Tenn.

IETF

Continued from page 1

client to the nearest host.

Francis' proposal noted that Cisco Systems, Inc. has a proximity server called Distributed Director that privides a HOPS-like service to provate Cisco router-based nets. However, it is not meant to serve as a public service, he stated.

IETF members said the HOPS proposal left many tricky technical issues unanswered. Issues such as how to probe for resources located behind Internet service provider and corporate firewalls will need to be addressed, they said.

Francis promised to revise his white paper, which can be found at www.ingrid.org/hops/wp.html, and revisit the topic at the next IETF meeting in Munich.

On the spam front, the IETF Responsible Use of the Network working group is putting out a document that warns that unsolicited mass mailings are unethical and "just plain rude."

Author Sally Hambridge said she hoped the antispamming paper her group is working on would educate some users and give ISPs help in crafting contracts to ban the practice. "It's a hammer [for ISPs]," she said.

But Internet users were skeptical about the impact of these efforts.

"Virtually all ISPs already prohibit spam as part of their contracts," said Mark Welch, a California probate attorney who runs an antispam Web site.

Other topics of interest at the meeting included:

- Domain names. Members of the International Ad Hoc Committee (IAHC) announced that their plan to add seven more top-level domain names and 28 new registries has been approved. A formal signing ceremony is planned in Geneva later this month, and the new names are expected to go into use in the third quarter.

But IAHC member Perry Metzger said the group's lawyers will not let the members comment on a lawsuit that could hold up the plan. Image Online Design, Inc., based in San Luis Obispo, Calif., claims it owns the rights to the .web proposed domain name.

- The year 2000 problem. If the Internet breaks down at the beginning of the next millennium, do not blame the IETF. The IETF has formed a working group to prove that its Internet protocols are ready for years ending in 00s.

- RSVP. The IETF has hammered out an overview of issues to consider when deploying the Resource Reservation Protocol to prioritize Internet traffic. The bottom line: It shows promise, but do not use it too widely or on critical networks until the bugs are worked out.

- Requests for comment. Could the IETF tradition of calling every document an RFC be coming to an end?

Mike O'Dell of UUNET Technologies wants to make the term history. He said it is too confusing for outsiders, especially when combined with terms such as proposed standard and draft standard.

Vendors often exploit the confusion to make users think their technology is standardized, he said.

"The term RFC is too polluted to swim any more," O'Dell said.

- Security. Steve Bellovin, a member of the Internet Architecture Board that helps oversee the IETF, said too many Internet protocols have security holes. He noted that the problem is now getting national attention in the mainstream media.

Bellovin also said the IETF needs to work harder to think about security issues as it continues to develop new technology. ■

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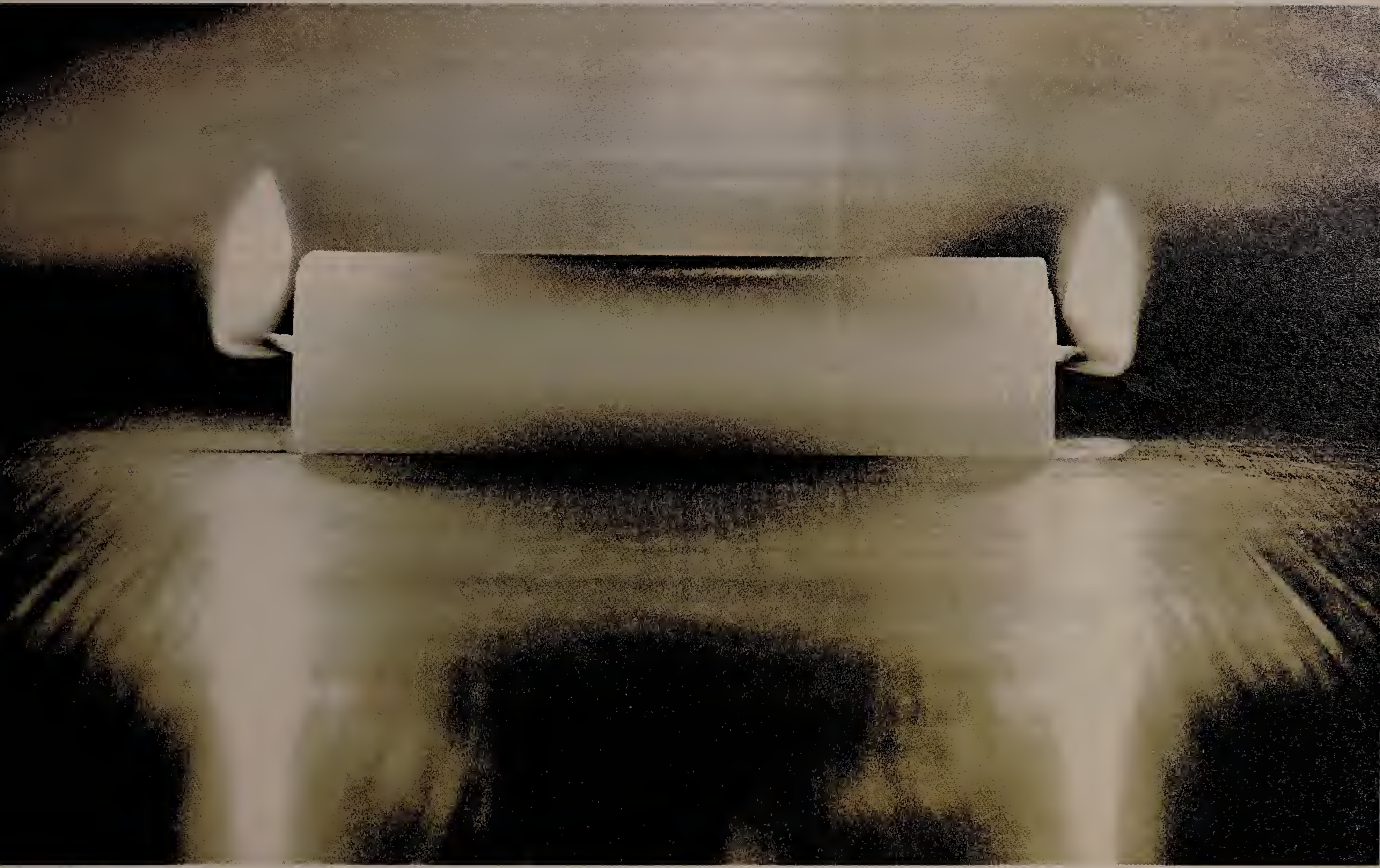

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MSIX

Continued from page 1

usage-based revenue possibilities.

But customers are less thrilled. "Users are not going to appreciate a la carte charges," said Dan Taylor, senior analyst at Aberdeen Group, Inc., a Boston-based consultancy. Those in the trenches agree.

"Many people here use the Internet as a business resource. [Usage-based pricing] could have a negative impact on their willingness to use the Internet," said Bob Galovic, managing director of information resources at the American Automobile Association, Inc. in Heathrow, Fla.

ISPs like it

PSINet, Inc. can envision scenarios for a usage-based charge, such as faxing, said Chuck Davin, the company's chief technology officer.

Packages may also be possible. Similar to how telephone companies offer call waiting, call return and caller ID for a bundled price, ISPs such as PSINet say a single billing platform and widely deployed protocol will let them offer comparable packages.

Such a package could include voice, videoconferencing and a subscription to a user's favorite online magazine or newspaper.

Netcom On-Line Communication Services, Inc. believes users will not have a problem paying for special services. "Users will come to understand that there is a cost of providing quality services that is tangible," said Mike Kallet, senior vice president of products and services at Netcom.

TCG CERFnet agrees. "CERFnet firmly believes the only way to support new applications is to charge based on usage," said Pushpendra Mohta, executive vice president at TCG CERFnet.

But analysts warned this thinking may lead the ISPs down the wrong path.

MSIX BACKERS

Fifteen software vendors have backed the Compaq/NetCentric Metered Services Information Exchange (MSIX) protocol, which will let Internet service providers charge customers, based on usage, for applications such as voice, video and fax over the Internet.

- **Acorn Communications**
- **Allaire**
- **Alpha Software**
- **DataBeam**
- **Dazel**
- **Dynaflo Systems**
- **Four 11**
- **IRDG**
- **Progressive Networks**
- **Software Partners/32**
- **StarBurst Communications**
- **Virtuflex Software**
- **Voxware**
- **VXtreme**
- **White Pine Software**

"They should offer users more value for their dollar rather than finding ways to bill them for what they are already doing," said Joel Maloff, president of The Maloff Co., a Dexter, Mich.-based consulting firm.

Vendor support

The protocol has also sparked the interest of software application companies. Fifteen software vendors have already committed to using the protocol once it is completed in July (see graphic). The protocol is expected to let ISPs use a single billing engine for all applications that are MSIX interoperable.

MSIX encapsulates data from specific application services. The protocol inputs key information in the header of each packet that tells the billing engine who is using the service, as well as the desired measurement information, such as length of time the user is connected, NetCentric's MacKay said. ■

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This seminar, taught by Daniel Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

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riefs

etwork General Corp. **GC)** *last week acquired pri- ely held 3DV Technology, Inc., ashua, N.H., developer of soft- re for* **managing Cisco stems, Inc. routers,** *Bay works, Inc. and Cabletron Sys- s, Inc. hubs, and LAN switches. C paid $20 million for 3DV.*

opper Mountain Net- rks, Inc. *is shipping a digital scriber line* **(DSL)** *package t includes customer-end dems and a carrier-class mul- exer. The company says the kage can provision DSL services for $500 per line when bought in bulk.*

The CopperEdge 200 mux is priced starting at $20,000. Red Rocket 201-10X modems for $599 for up to 416K bit/sec l Red Rocket 201-30X lists for 9 for up to 1.168M bit/sec.

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otorola Information stems Group *last week nounced its 3460 Fast'R family* **Windows-configurable dems.** *The dual port, 33.6K sec 3460 modems can be uped in units of 32 in a single ssis. A new Windows-based t'R Vu software package en- es users to configure and test many as 128 Fast'R modems currently. Available now, st'R series modems cost $595.*

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Acclaim Communications, **c.** *recently introduced T-1 Chan- ization to its multiprotocol me Relay Access Device and uter, the Acclaim 3200FR. esigned to support* **voice er frame relay,** *the 3200FR ludes an integral T-1 or E-1 U, a bit-error rate tester, two ernet ports, two high-speed chronous serial ports and two onal voice over frame relay ts.*

vailable now, the 3200FR is ced at $3,495; the T-1 Channel- tion module is $795.

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Arch rival steals back key Cisco executive

Francis to take on IBM NHD marketing role.

By Michael Cooney
Raleigh, N.C.

The networking industry is full of wacky relationships and strange bedfellows, and last week's news was no exception.

As director of marketing for Cisco Systems, Inc.'s InterWorks Business Unit (IBU), Nick Francis was one of the most vocal, anti-IBM executives in the industry. Now Francis has done what many thought impossible: He quit Cisco to rejoin Big Blue, the company he left in the early 1990s.

IBM last week announced that Francis will become vice president of marketing for IBM's Networking Hardware Division (NHD).

He will report to Lee Roberts, general manager and vice president of worldwide marketing and sales for NHD. Lutz Hahne, general manager of IBM's NHD, said he welcomed Francis back to the IBM fold and that Francis should help NHD focus its future network marketing efforts.

Gaping hole

Francis' departure, however, leaves a gaping hole at the top of IBU's hierarchy. Cisco recently promoted IBU Vice President and General Manager Cliff Meltzer to lead Cisco's Internet service provider group.

For now, Selby Wellman, senior vice president of Cisco Business Units will serve as the interim IBU leader. Wellman said Francis' move to IBM will have little, if any impact, on IBU. He said it might even be beneficial.

"It could be the catalyst that will help Cisco and IBM work more closely together," Wellman said. "The IBU has some 250 employees, and there is plenty of talent here to keep our plans on track."

Wellman also noted that the search for a new general manager is already under way.

Sticks and stones

While fighting to establish Cisco's IBU and its SNA products as viable alternatives to IBM, Francis, Meltzer and others in IBU have been relentless in their attacks on IBM.

Analysts said their departures will hurt the unit. "Granted, one guy may be dispensible in most companies this size, but Cisco's IBU has now lost all of its top tactical strategists — the guys who knew the market. It has to have some impact," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

"Francis started that group and got it on the map. His leaving and going to IBM doesn't portend well for Cisco," he said.

Others wondered how Francis will be able to lead a unit he disparaged so often over the past few years.

"There's no love lost between him and the folks at NHD," said one analyst who requested anonymity. "The idea that he will now be in the top echelon of people running NHD will rankle a few feathers." ■

What IBM has done with [illegible] is [illegible] a smoke screen of confusion and fear. Well, we aren't going to take that anymore.

IBM's Nick Francis,
formerly of Cisco
(*NW*, Nov. 25, 1996, page 1)

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Network management

Vendors broaden management wares

By Jim Duffy

Two vendors have expanded offerings for management of WAN access links and the applications that utilize them.

Digital Link Corp. last week announced the WANview Unix Network Management System, an SNMP element manager for graphical configuration, performance analysis and diagnostics of the company's DSUs/CSUs.

And BMC Software, Inc. announced integration partnerships with Axent Technologies, Inc. and Unison Software, Inc. to bolster the security and job scheduling capabilities of BMC's Patrol application management software.

Digital Link's WANview Unix is integrated with Hewlett-Packard Co.'s OpenView enterprise management platform, enabling service providers to manage up to 50,000 DSUs/CSUs for 56K bit/sec to 155M bit/sec Internet, frame relay, private line, Switched Multimegabit Data Service and ATM WAN links.

WANview Unix supports a multilevel hierarchical map that represents countries, cities, buildings or computer rooms. Events, alarms and topology changes are stored in an Oracle Corp. database, allowing managers to use SQL commands to filter and extract relevant details for faulty network segments.

WANview Unix is available now and is priced at $9,999.

Software on Patrol

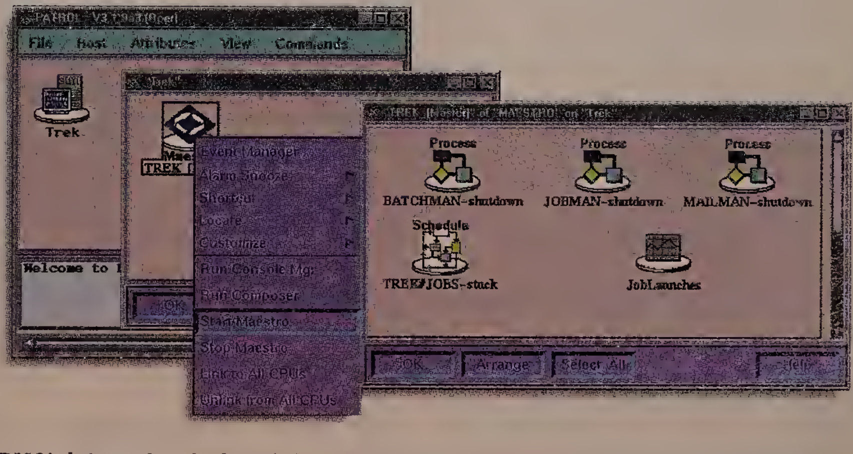
BMC's deal with Axent will enable Patrol users to incorporate Axent's OmniGuard security management capabilities into users' overall application management routine. OmniGuard Enterprise Security Manager provides central management and enforcement of corporate security policy with graphical displays of security status.

OmniGuard Intruder Alert provides real-time detection of suspicious activity in firewalls or Web servers, 24-hour monitoring of network access attempts and automatic eviction of unauthorized users.

The arrangement with Unison will allow users to launch the Maestro job scheduler from a Patrol console.

Maestro initiates and manages jobs across distributed networks and reports and restarts job failures.

© Digital Link: (408) 745-6200; BMC: (800) 841-2031



BMC's Integration *deals with Axent and Unison enable Patrol users to access security and job scheduling apps from their application management console.*

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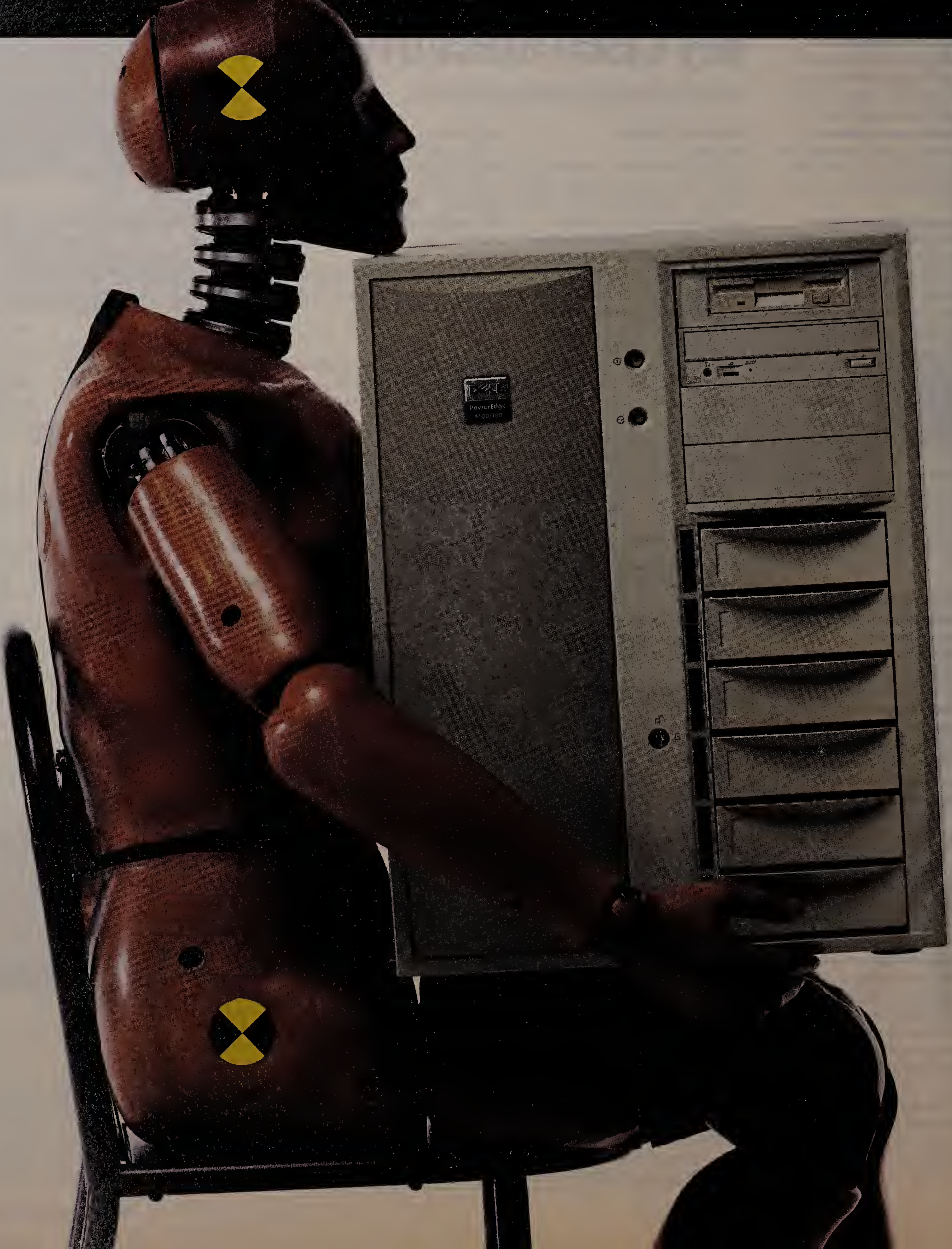

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INTERNETWORKING MONITOR

Gigabit Ethernet vendors: Don't self-destruct

Gigabit Ethernet companies have been handed a gift. No, I don't mean the gift of polysyllabic gab — though they do have that down. I mean the gift of running in a technology race where their role is largely uncontested. But if these companies are not careful, their collective drive to showcase the advanced technological aspects of Gigabit Ethernet might end up scaring off mainstream network managers.

"Carrier extension," "buffered repeaters," "scatter/gather." Welcome to the "simple" world of Gigabit Ethernet. But jargon-laden marketing, designed to dif- ferentiate products, illustrate strengths and ultimately promote sales, may have the opposite effect.

So far, these outfits have had it pretty good. An unprecedented confluence of events has given them the easiest ride since the introduction of Ethernet.

Kevin Tolly

For starters, Gigabit Ethernet's only potential competition, ATM, is in the doldrums. Apparently, the charmed life led by ATM early on left many of its promoters untrained in the pugilistic ways of high-tech marketing. Now that a fight is required to prevail over Gigabit Ethernet, few ATM companies seem willing or able. (ATM vendors: That has to change.)

Gigabit Ethernet also lucked out by bringing out what the outside world perceives as a single standard. In doing so, vendors avoided the internecine struggle that erupted between competing camps in the 100M bit/sec Ethernet arena.

Finally, Gigabit Ethernet's status as the "natural evolution" of Fast Ethernet allows vendors to build on the incredible success of that 100M bit/sec technology.

But now, vendors are starting to focus on highly technical aspects of the technology. Ironically, these jargon-laced discussions actually bring out issues that vendors might prefer remain dormant.

Network managers looking into the areas of carrier extension and buffered repeaters, for example, will learn that physical limitations at such high speeds required vendors to devise alternative physical layer implementations.

Those who look deeper into the areas of interrupt coalescence and scatter/gather will learn that these are techniques (proprietary at the moment) being developed to off-load work from a server hosting a Gigabit Ethernet adapter. Highlighting such a great solution might just serve to point out an area of concern — excessive CPU consumption by Gigabit Ethernet network interface cards — that might not have occurred to the buyer.

So even though product differences are inevitable, vendors should strive for simplicity and solidarity. If Gigabit Ethernet is perceived as being overly complex, potential adopters could delay implementation.

Worse, should infighting among Gigabit Ethernet vendors become visible to the outside world, the resultant splintering could give the ATM forces time to regroup.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or via the Internet at ktolly@tolly.com.

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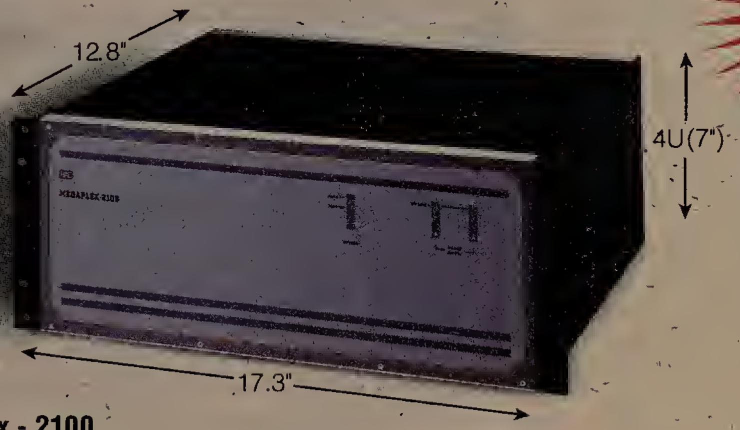

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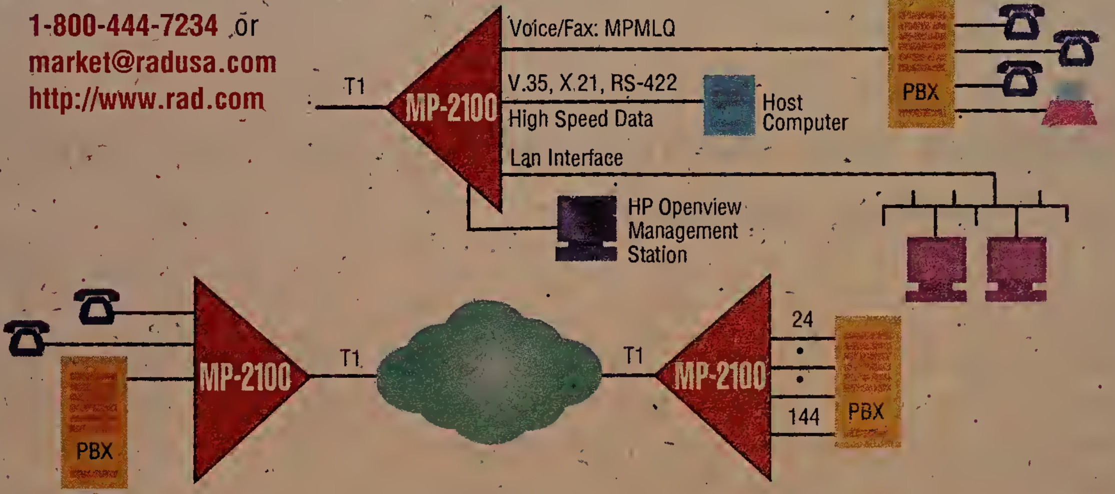

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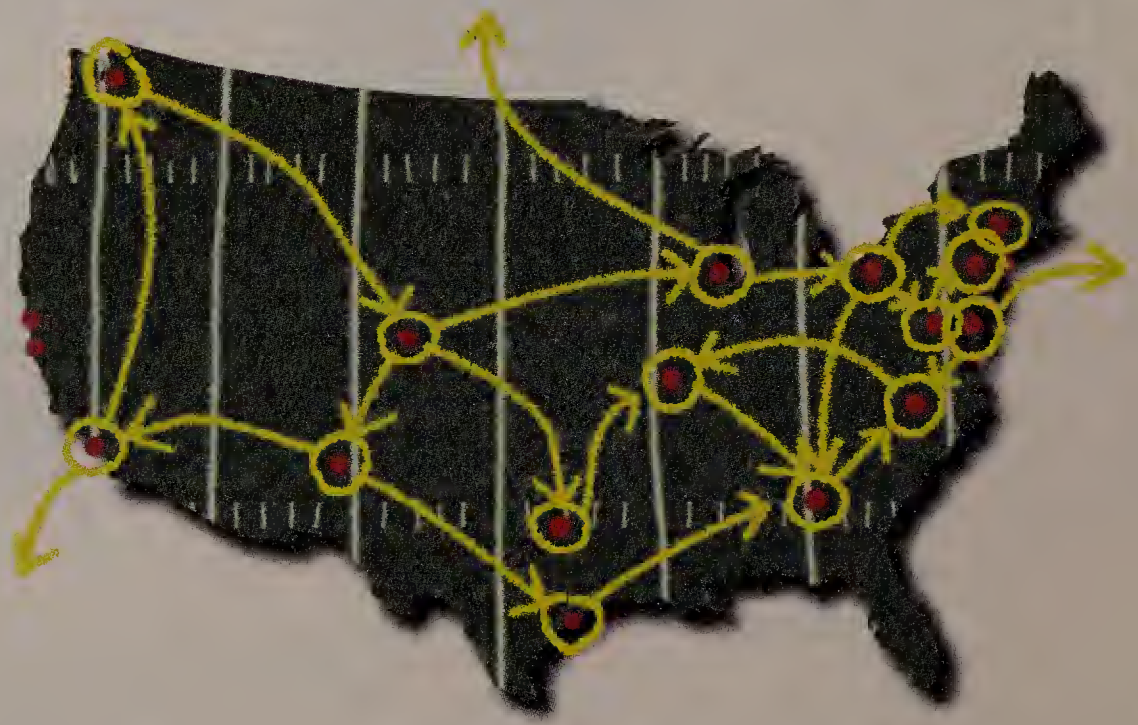

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Briefs

■ *After a slow start, the new* **888 toll-free area code** *has proven so successful over the past few months that industry watchdogs have declared that it is time for yet* **another toll-free code.**

The 877 code will go into effect in April 1998, according to the Alliance for Telecommunications Industry Solutions, a carrier standards group.

■ **GE Capital Spacenet Services, Inc.** *earlier this month announced an agreement to* **purchase AT&T Tridom,** *a division of AT&T that focuses on very small aperture terminal satellite communications services.*

"GE Spacenet primarily serves customers in the U.S., Europe, India and Latin America through **VSATs,"** *said Gino Picasso, resident at GE Spacenet in McLean, Va.*

© GE Spacenet: (703) 848-1000

■ *Satisfying a growing interest in its activities, the* **Federal Communications Commission** *has proposed that it accept* **E-mail comments** *on all its rulemakings. Recent trial runs of E-mail comments have proved wildly popular, especially when they addressed Internet-related issues.*

■ *The quality of communications between the* **U.S. and the Asia-Pacific region** *is expected to increase by the end of 1999.*

A group of 10 telecommunications companies announced they signed a memorandum of understanding to build a **submarine cable network** *linking China, Japan and Korea with the U.S.*

AT&T, China Telecom, KDD, Korea Telecom, Hong Kong Telecom International, Ltd., MCI International, Nippon Telegraph and Telephone Corp., SBC Communications, Inc., Sprint Corp. and SINGTEL are joining to build the China-U.S. Cable Network.

The network will consist of four 20G bit/sec fiber pairs that will be deployed in a loop configuration.

Anixter gamble on 'no-name' carrier pays off

By Tim Greene
Skokie, Ill.

Back in the fall of 1995, not many people had heard of Scitor as a frame relay service provider, certainly not the management at network integrator Anixter, Inc.

But when AT&T, Anixter's carrier in Europe, set a March 1, 1996, deadline for shutting down the service that supported 9.6K bit/sec links to 16 Anixter sites, Scitor's aggressive bid caught the eye of Anixter's network director, Ken Braun.

Braun liked Scitor's plan for keeping the sites connected and gave the carrier a shot. Scitor came through so well that it subsequently won the contract to set up Anixter's 60-site frame relay network, which spans 23 countries on four continents.

But it was a risky play for Braun. "You're not going to get fired for using AT&T, but you could get fired for using Scitor back then if they failed, since nobody knew who they were," Braun said.

People still might not know the company because it changed its name to Equant. But the company is still offering frame relay services.

For Braun, response time from the Equant frame relay network was crucial because Anixter was supporting remote SNA traffic to its mainframe here.

"We can't afford to give our SNA traffic anything but the best service because it is so real-time sensitive," Braun said.

Most of the frame relay pipes are at least 64K bit/sec with a committed information rate of 32K bit/sec, with a few 128K bit/sec with a 64K bit/sec CIR. The largest pipe, which is to a hub in the U.K., runs at 256K bit/sec with 128K bit/sec CIR.

HOW MUCH DELAY?

Anixter's global frame relay network from Equant gives these average response times:

Global: .73 seconds
Europe: 1 second
Asia: 1 second

Braun credited Equant's Data Link Switching with maintaining SNA sessions even when the frame relay line is lost.

"The router will recognize that, dial its ISDN backup back into the cloud, and the people on the remote mainframe sessions will hesitate but won't even lose their link to the mainframe. They'll still be up and alive," Braun said.

Not without a hitch

There were problems. The most notable: Sometimes the ISDN backup switches would kick in when the frame relay line was still up, and sometimes the ISDN switch would fail when the frame relay line dropped. The second case caused outages for up to an hour, but the terminal adapters were reconfigured and the problem cleared up, Braun said. With most of the network up and running earlier this year, Anixter was impressed with Equant's ability to get overseas lines installed quickly.

"What we've seen is they are at least a month or two faster than anybody else because they have local people," he said. ■

Cisco LS 1010 finds role in networks

By Jim Duffy
San Jose, Calif.

Despite its rearing as an anchor for campus networks, Cisco Systems, Inc.'s LightStream 1010 ATM switch is finding a home in carrier nets.

Cisco recently announced deals with Teleport Communications Group, Inc. (TCG) and Telecom Finland whereby the carriers will use the 1010 as a provisioner of data services. Cisco also recently announced some circuit emulation capabilities for the switch that enable service providers to deploy it as a voice/data integration platform.

These developments came as Cisco last week announced the 13-slot Catalyst 5500, a LAN/ATM switch for campus networks, and as a Wall Street analyst forecasted the demise of the 1010. But Cisco scoffed at such proclamations and said it is even developing a higher capacity version of the 1010.

The five-slot LightStream 1010 is a 5G bit/sec switch initially designed for use in the workgroup or campus. The switch features available bit rate service for congestion control and the Private Network-to-Network Interface specification for ATM routing. It is also field-upgradable to support changing ATM specifications and standards via "feature cards."

Cisco is working with service providers to tailor the 1010 to their requirements. For TCG, Cisco added DC power and greater port density to the switch, said Dan Minoli, TCG's director for data engineering and development.

TCG, which upgraded to the 1010 from the moribund LightStream 2020, is using the 1010 to deliver high-speed LAN internetworking service for the New York metropolitan area. LANs on the customer premises are linked to a Cisco 4700 router, which is linked via ATM to the 1010 at the TCG point of presence. "I basically provide a bridged connection between locations," Minoli said.

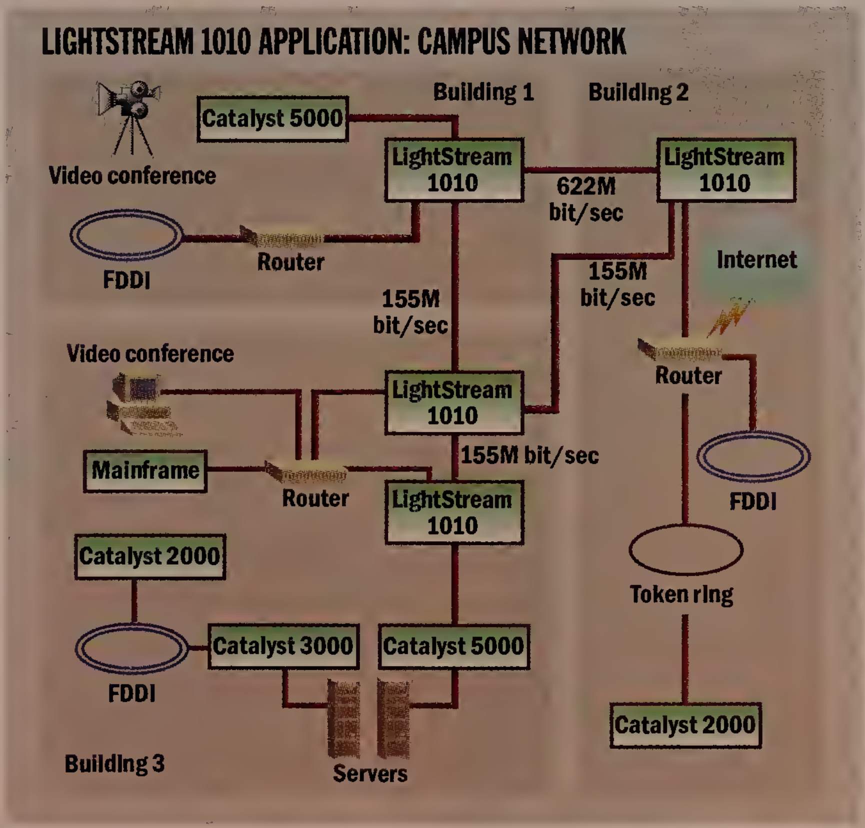
Cisco also worked with Telecom Finland to customize the 1010 as a backbone and access node in what the carrier claims is the world's largest ATM net.

Despite these apparent wins, the future of the LightStream 1010 has been called into question now that Cisco is rolling out next-generation routers and switches. Gina Sockolow, an analyst at Schroder Wertheim & Co. in New York, stated in her Feb. 7 newsletter that the 1010 is "likely to be discontinued within 12 months" to make room for the Catalyst 5500, the Gigabit Switch Router (*NW*, March 31, page 1) and a Gigabit Ethernet switch.

A Cisco reseller in the Northeast who requested anonymity said the company is "de-emphasizing" sales of the 1010.

Cisco dismissed such talk. "With some of the voice capabilities that we're going to be coming out with on that product, it's going to be a platform we take into new environments and continue to enhance," a Cisco spokesman said. ■

LIGHTSTREAM 1010 APPLICATION: CAMPUS NETWORK



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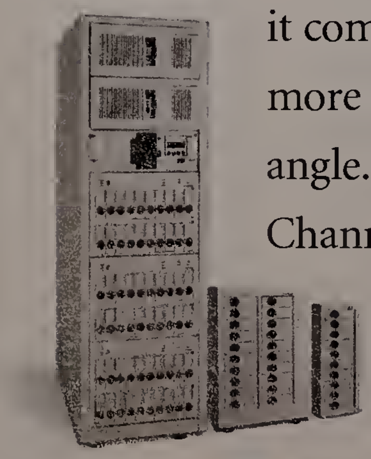

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Briefs

■ *Milpitas, Calif.-based* **Storage Dimensions, Inc.** *last week announced that it extended support of its* **SuperFlex 5000 RAID storage product to Digital Alpha/Windows NT** *environments. Until now, SuperFlex systems have provided support for Windows NT on Intel Corp. platforms. Pricing for the SuperFlex 5000 for NT/Alpha starts at $13,500 and the product is available now.*

© Storage Dimensions: (408) 954-0710

■ **Asante Technologies, Inc.** *last week rolled out a pair of* **Ethernet/Fast Ethernet switches** *designed for workgroup and desktop environments. The company's IntraStack 10/100 switch, which can be stacked up to three units high, supports as many as 14 dual-speed 10M/100M bit/sec switched Ethernet ports.*

For the desktop, Asante is offering a 24-port Ethernet switch with three 100M bit/sec connections for server or backbone links. Both switches include a built-in HTTP server for **device configuration and management** *via a standard* **Web browser.**

The 14-port switch is priced at $4,750 and will ship in June. The 24-port device costs $2,750 and is available now.

© Asante: (800) 662-9686

■ **Intel Corp.** *last week announced the Intel Express 100FX switch, an eight-port* **Fast Ethernet fiber-optic switch.** *The switch, which supports Layer 3 switching, is a result of Intel's acquisition of Case Technology. The Express 100FX switch is available now for $11,995.*

© Intel: (800) 538-3373

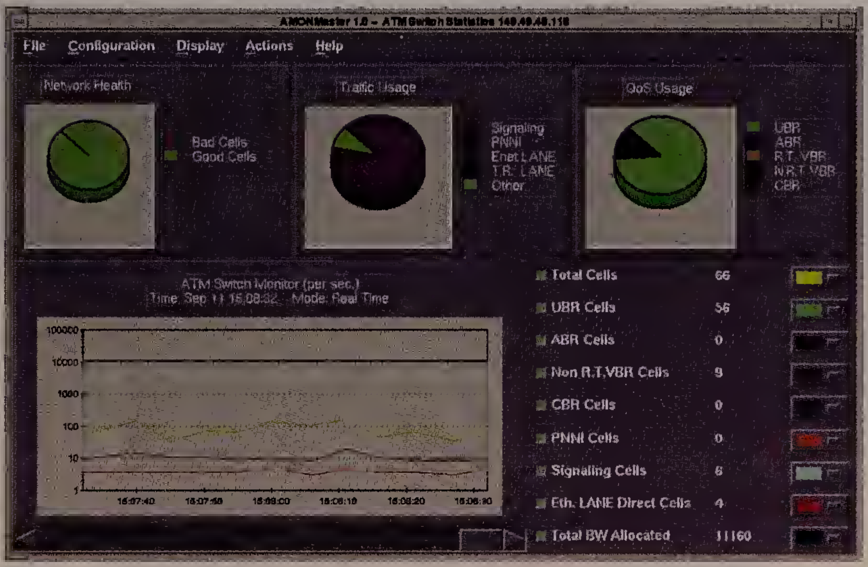
Madge unveils tool for managing and monitoring ATM/Ethernet networks

Vendor also rolls out PCI token-ring adapter for $199.

By Jodi Cohen
San Jose, Calif.

If there's ATM in your network, it's probably not alone. Most customers have a mixed Ethernet and ATM environment, which can be good for performance but tough to manage.

That is why Madge Networks, Inc. last week extended its LAN management software to include ATM switches. Madge's SMONMaster 2.0 lets customers, for the first time, troubleshoot and control both cell- and frame-based networks from a single console.



AMONMaster 1.0 – ATM Switch Statistics 149.49.48.118

Total Cells 66
UBR Cells 56
ABR Cells 0
Non R.T.VBR Cells 9
CBR Cells 0
PNNI Cells 0
Signaling Cells 6
Eth. LANE Direct Cells 4
Total BW Allocated 11160

Madge's new software *provides customers with one tool to manage both cell- and frame-based switched networks.*

Typically, customers have to use external ATM analyzers to monitor ATM switch traffic and a separate management application to handle switched Ethernet traffic, which can be cumbersome, costly and time-consuming, analysts said.

"Customers usually have to piece together six or eight different net management applications to try to figure out what's going on in the network," said Jim Meztler, vice president of consulting services at Strategic Networks Consulting, Inc. in Boston. "This gives LAN managers one tool that covers frame and cell switching."

The highlight of Madge's SMONMaster 2.0 software — other than its ability to manage mixed nets — is the ATM switch statistics it provides. Customers can measure switch utilization and spot problems such as excessive errors or signaling. Net administrators can also monitor ATM conversations across switches and analyze things such as resource usage, emulated LAN requirements and quality-of-service traffic allocation.

Madge plans to add support for SMONMaster 2.0, comprising switch-based agents and a management console, for token-ring switches in the fourth quarter.

The application is part of an overall management suite, which is priced at $11,500. Existing SMONMaster customers can upgrade to Version 2.0 for $3,000. Also, customers must pay a $1,995 license fee per ATM and Ethernet switch to be monitored. SMONMaster 2.0 is available now.

Presto PCI

Separately, Madge unveiled a token-ring adapter in an effort to attract customers of competing vendors' gear. Madge's Presto PCI token-ring adapter is specifically designed for PCI clients and supports most desktop operating systems.

Madge's PCI token-ring adapter is the first to break the $200 mark, according to industry observers. Competitor 3Com Corp. last week also announced a price reduction of its similar card to $260. Prior to this price war, the least expensive PCI token-ring adapter cost $325 from Olicom, Inc.

The increased competition in this market is because there are no new customers entering the token-ring market, so vendors must woo existing customers away from competitors with pricing in order to increase market share, analysts said.

The PCI adapter is available now for $199.

© Madge: (408) 955-0700

www.nwfusion.com

There's more online:

- A detailed overview of the complexities of ATM management
- A guide to selecting a network management platform

NetworkWorld Fusion

Microdyne scraps Novell focus

By Jodi Cohen
Alexandria, Va.

Microdyne Corp. is about to get the red out of its product line.

The company announced it has shifted its product focus away from Novell, Inc. NetWare environments and instead will target the growing Windows NT and 95 worlds. The first evidence of this new strategy came last week when Microdyne rolled out its EtherMAX family of Fast Ethernet hubs, switches and adapters, the company's first platform-independent product line.

"A year ago, having the red box was a very strong selling point for us, but now we need to move away from our Novell-centricity," said Marshall Thames, vice president of product management and engineering at Microdyne.

"We are moving away from being a Novell-centric company and are reaching out to other platforms."

Marshall Thames, vice president of product management and engineering, Microdyne

The new EtherMAX family includes a trio of LAN switches, all of which can be managed by any SNMP-based management platform.

At the low end, Microdyne offers a switch that provides four 10M bit/sec Ethernet ports and one 100M bit/sec Ethernet uplink. An-other switch supports four switched Ethernet ports as well as an integrated four-port Fast Ethernet repeater.

At the higher end, Microdyne's workgroup switch supports virtual LAN capabilities, IP switching and all nine Remote Monitoring groups. The device has 16 10Base-T ports and two Fast Ethernet uplinks for server connections.

The company also rolled out an eight-port unmanaged Fast Ethernet hub and a 12-port stackable version of the hub that comes with an optional management unit.

Along with the hardware, Microdyne announced its InTouch software that lets users receive management updates via the Internet.

Pricing for the EtherMAX switches starts at $995 and the hubs at $579. All EtherMAX products will be available in the second quarter, and the InTouch software will be available this summer.

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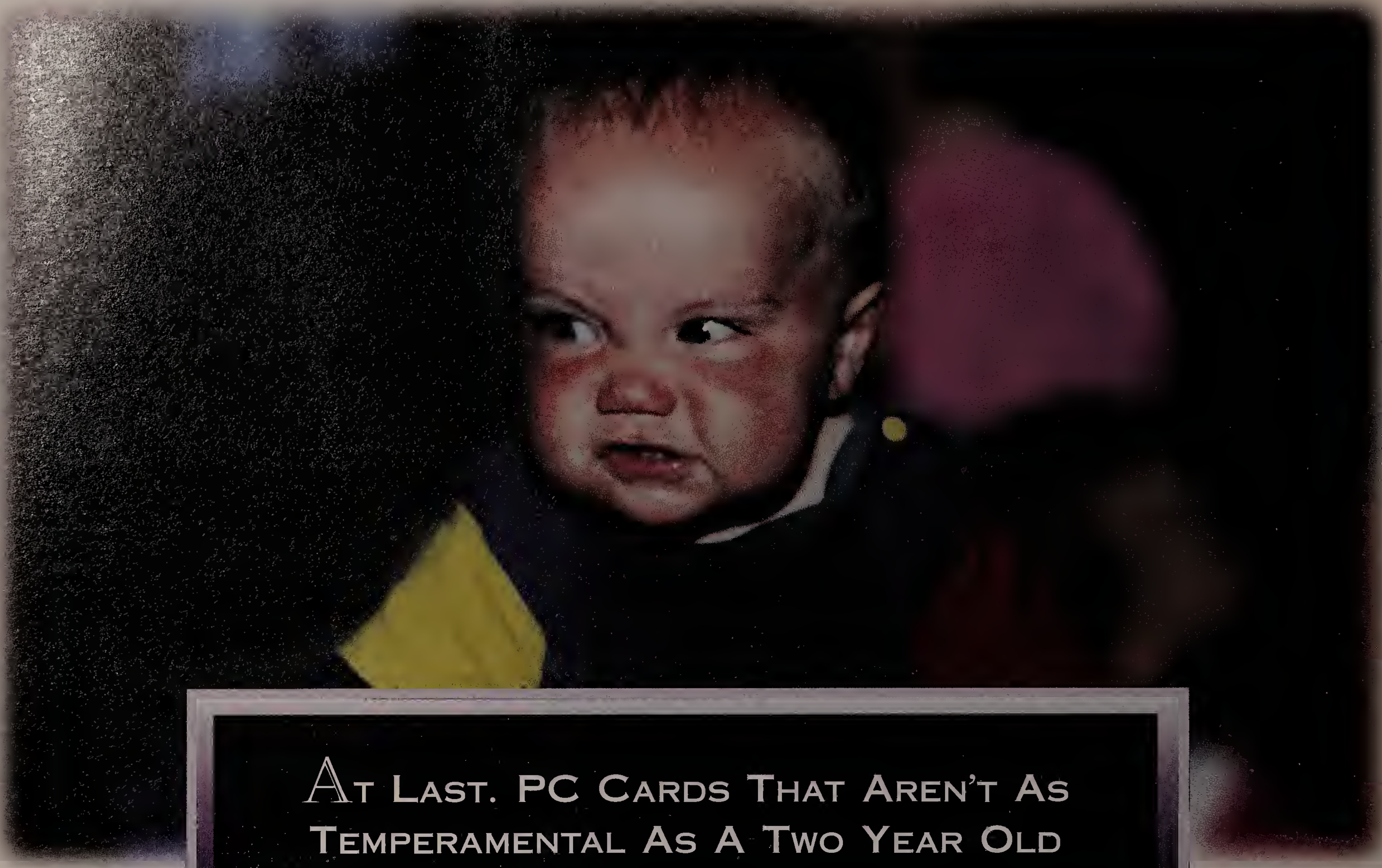

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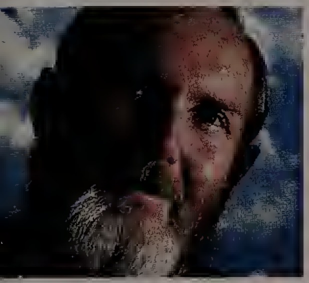
IRED WINDOWS

Bundling strategies: Bane or boon?

"If computers get too powerful, we can organize them into a committee — that will do them in."

—Bradley's Bromide

The recent Novell, Inc. and Netscape Communications Corp. agreement to form Novonyx, Inc. to distribute Netscape's SuiteSpot reminded me of one thing Microsoft Corp. does well: adopt successful strategies from its competitors. In fact, it does it better than any other company in the software industry. Big companies, small companies, start-ups — size doesn't matter. Nor does the success of the particular rival product, specification or business strategy.



Dave Kearns

One case in point: A new bundling strategy for BackOffice, Microsoft's NT server-based grouping of back-end applications, which currently includes Exchange Server, SNA Server, SQL Server and Systems Management Server (SMS).

While Netscape's SuiteSpot bundling of services for its enterprise server software hasn't been a rousing success, it has attracted enough attention for Novell to fund the Novonyx start-up with Netscape. Novonyx will port various SuiteSpot components to an IntranetWare platform.

Now we hear that Microsoft is about to do something similar with BackOffice. The new packaging initially will involve specific server applications for targeted markets, such as the Commercial Internet System, which is aimed at Internet service providers. Most likely another bundle will be aimed at in-house Web servers that combine some of these same services with a Proxy Server and Transaction Server.

Now they just need to take the last step and adopt the rest of the SuiteSpot strategy, which is to offer a large number of services — currently 10 — and price them according to the number you buy.

As a net administrator, it always irked me that I had to buy SNA Server in order to get SMS because absolutely nothing in-house was using SNA services.

For free, I'll offer a better idea. Put all of the BackOffice applications on two or three CDs and sell it to me for the cost of media and shipping. Put all of the documentation, white papers, etc. on them so I can learn the function and specifications of each service. Then provide a way for ujuk me to obtain an "activation key" when I want to install a service.

Price them on a sliding scale — the more services I buy, the less each service costs. It's an idea Novell tossed around a few years ago but never implemented, except for the activation key.

Even better, make each of the services installable as a 30-day evaluation trial with full functionality, perhaps limited to five or 10 users. And by simply pressing the activation key, I can convert to a real installation.

"Try before you buy" was how shareware got started, but it's an idea that is ready for mainstream software vendors to adopt.

Kearns, a former network administrator, is a freelance writer and consultant based in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

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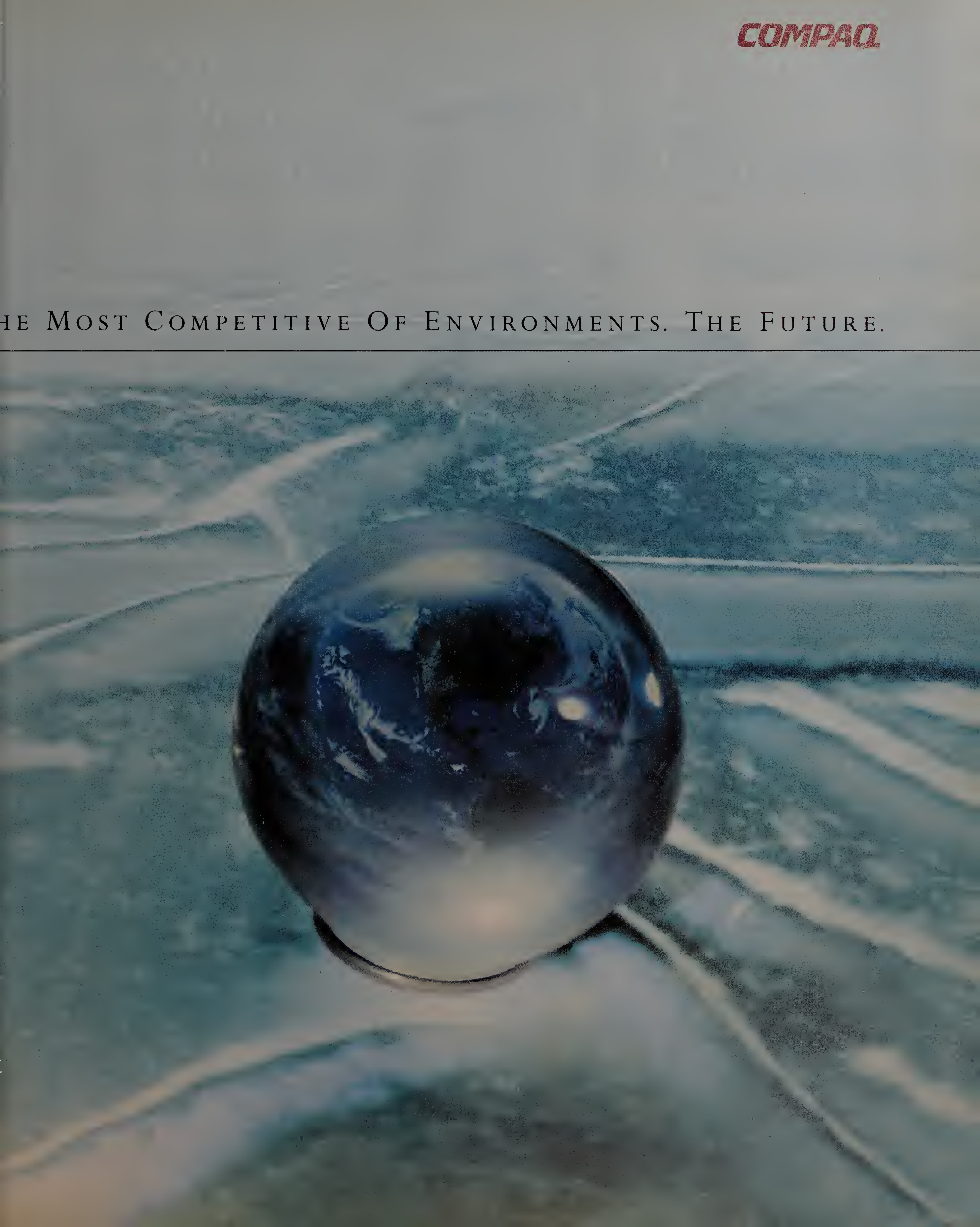
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NT and Unix: Friends, foes or co-conspirators?

Wide spectrum of traditional Unix vendors view and handle Windows NT Server differently.

By Christine Burns

Traditional Unix vendors are nervously looking over their shoulders at the encroaching Windows NT juggernaut.

There is little dispute about the mark Microsoft Corp. has made over the past four years in the PC LAN arena with its NT Server. But now, with NT largely accepted as a viable alternative to competing network operating systems, such as Novell, Inc.'s IntranetWare and IBM's OS/2 Warp Server, Microsoft has set its sights on the more robust market space currently owned by Unix.

Unix vendors have reacted in different ways to NT's coming of age. It has ignited fierce competition among some players. For others, it sparked the motivation for better NT and Unix integration tools. And still others have established partnerships with Microsoft that give them a "popular little brother" system that compliments Microsoft's more mature, high-end offerings.

This coexistence has resulted in NT and Unix systems that run peacefully on the same network, giving customers the opportunity to mix and match machines based on application choice and cost.

No matter how Unix vendors have chosen to view the NT phenomenon, they do agree on one thing: NT's success, which last year registered 85% growth over 1995 sales, does not signal the demise of Unix.

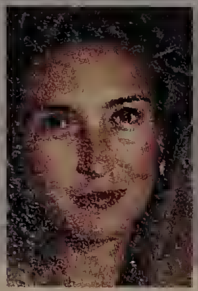
UNIX VENDORS SPEAK UP ON NT

"NT is a vehicle that will help us bring our fault-tolerant expertise into other markets."

Jim Olivero, product marketing manager, NT Systems Division, Tandem Computers

"The tunability of Unix to specific applications and platforms will always be a unique contribution that can't be offered by the mass-market approach of the Wintel model."

Dick Watts, vice president, Computer Systems, Hewlett-Packard



"I am not here to sell NT. I am here to make sure that IBM captures its share of the NT market in terms of software and hardware that works with NT."

Jocelyne Attall, vice president, NT marketing, IBM

"The tide is coming in, and it's lifting all the [NT and Unix] boats. The notion that one is beating out the other here just isn't the case. It's not a zero-sum game."

Scott McGregor, senior vice president, server products, The Santa Cruz Operation

"The tide is coming in and lifting all the [NT and Unix] boats," says Scott McGregor, senior vice president of The Santa Cruz Operation, Inc.'s (SCO) server products.

"The notion that one is beating out the other here just isn't the case. It's not a zero-sum game. The whole market is growing," McGregor says.

According to research by International Data Corp. (IDC) in Framingham, Mass., NT shipments rose from 393,000 in 1995 to 725,000 in 1996. Likewise, Unix server shipments grew 13% from 535,000 to 602,000.

"Unix is moving upscale to bigger and bigger enterprise-class solutions, while NT is gobbling up the low end like Pac Man," says Dan Kusnetzky, director of IDC's Unix and client/server environments.

Robert Henson, manager of IBM's AIX marketing, predicts the majority of NT revenue through 1999 will be realized through its continued adoption as a low-end entry server.

"There are things that Unix does today that NT cannot even touch, like run reliably on large configuration systems in enterprises that need 24-by-7 uptime," Henson says. "CIOs make investment decisions on that type of availability. NT has just not proven itself in that regard yet."

Reliability, scalability and application support is the one-two-three punch vendors say will keep Unix in the enterprise.

Unix runs on symmetrical multiprocessing (SMP) boxes that scale up to 64 CPUs. It has supported clustering for more than five years now. In comparison, while NT can handle four-way SMP servers, industry tests show that scaling beyond that does not yield any further price/performance.

On the clustering front, Microsoft will not deliver its NT-based clustering technology, code-named Wolfpack, until this summer. The first iteration will provide only two-node failover.

"We have all of the mission-critical applications working in our favor," says Steve McCay, vice president of Sun Microsystems, Inc.'s Solaris Product Group. "CIOs won't buy NT if it doesn't support the applications they need to run their business."

Sun's Solaris, IBM's AIX, Hewlett-Packard Co.'s HP-UX and SCO's UnixWare support upward of 12,000 business applications each.

HP's Vice President of Computer Systems Dick Watts said the Unix operating system can be tuned to get the most from every application.

"Tunability that lets a customer get the best performance from his apps is a point for Unix," Watts says.

The final Unix advantage is platform support. Whereas Microsoft has committed to supporting NT only on Intel Corp. and Digital Equipment Corp. Alpha boxes from this point on, Unix continues to run on those platforms as well as on MIPS, PA-RISC, PowerPC and many others.

FACT: UNIX IS NOT DEAD

The Unix systems market grew 12% worldwide in 1996 to $34.3 billion.

- Mid-range system revenue took the biggest jump, up 34% over 1995 sales to $9 billion.
- The Unix RISC workstation market was the only revenue segment to decline.
- Sun, HP and IBM topped the Unix list, pulling in $6.7 billion, $6.6 billion and $5.5 billion, respectively.

SOURCE: IDC, Framingham, Mass.

Market reality

In addition to outlining why Unix will always have its place in the enterprise, most vendors understand that they must be able to play in mixed NT and Unix networks.

SCO, IBM and Digital have all made considerable headway in NT/Unix interoperability.

SCO ships add-on software that makes its Unix servers handle file and print services as if they were NT boxes. SCO is also standing behind Microsoft's effort for an Internet file system standard for storing distributed data across NT and Unix machines.

IBM has structured its entire middleware strategy around supplying software that runs across NT and its OS/2 Warp Server, Unix and mainframe systems.

"We have more middleware that runs on NT than Microsoft does," says Jocelyne Attall, IBM's vice president of NT marketing.

While IBM will always push its own operating systems first, Attall says that should a customer choose to go with NT, IBM will still sell them middleware.

Digital offers a program, called AllConnect, that provides integration software and enterprise service and support for allowing HP-UX and NT to coexist on the same network.

AllConnect is a result of Digital's long-standing NT-based partnership with Microsoft. It comprises everything from working together to tune NT to run on Alpha machines to Digital reselling NT alongside Digital Unix and supporting both in its worldwide service and support programs.

HP recently worked out a similar agreement with Microsoft. HP was criticized for doing so by other Unix vendors that viewed the move as a lack of committment to the Unix platform.

Watts contends that HP is as committed as ever to HP-UX, and that the new partnership puts HP in a good position to have more control over how and when NT gets sold into its corporate accounts.

"We do not intend to position NT as an enterprisewide, mission-critical backbone operating system with anything like the breadth of HP-UX," Watts says. "Each has its appropriate place in the network, and we will make sure that HP-UX maintains its place."

Industry observers note that HP-UX and several other flavors of Unix are going to maintain their position in the network for some time to come.

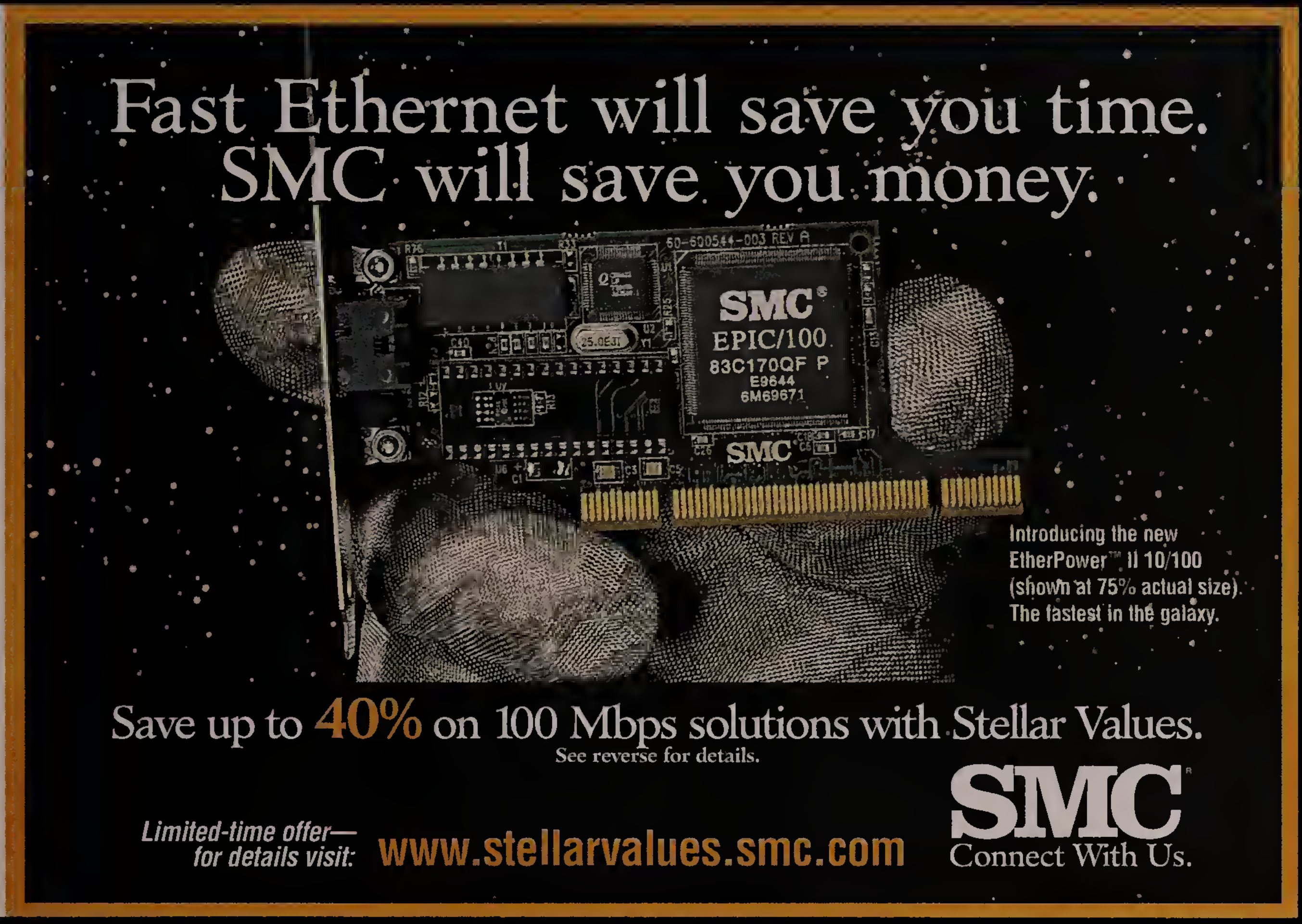
Forrester Research, Inc. in Cambridge, Mass., surveyed IT managers of large global companies. 76% say they will continue to buy both Unix and NT well into the future. Only 24% plan to standardize on NT.

But as NT begins to creep into the Unix space, vendors will be fighting for shrinking market opportunities. This "Unix squeeze" will likely force many players out of the market, according to Forrester.

Forrester predicts Java will keep Solaris alive and electronic commerce will give AIX a boost. It also predicts SCO's current hold on the Intel Unix market will further allow the company to supply the operating system to hardware vendors such as NCR Corp. and Data General Corp., which now maintain their own flavor of Unix.

Despite the Unix consolidation NT may precipitate, Unix is expected to be around for the long haul.

"Well after the year 2000, the world is still going to be largely heterogeneous," Kusnetzky says. "Unix is not going to be dead any time soon." ■



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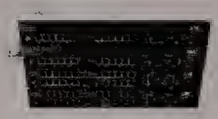
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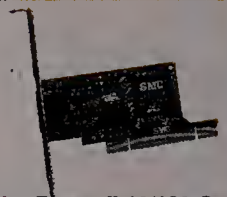
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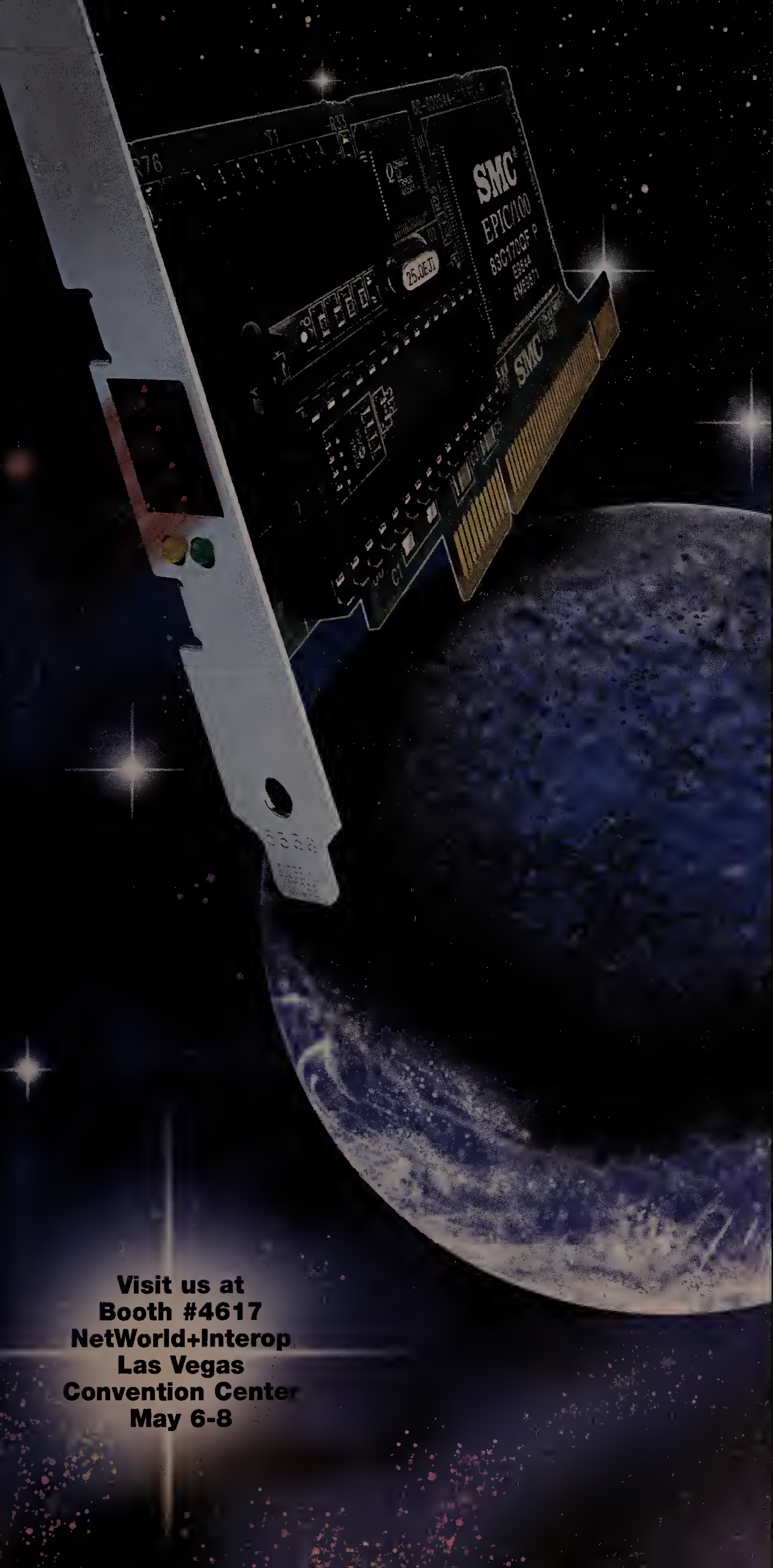

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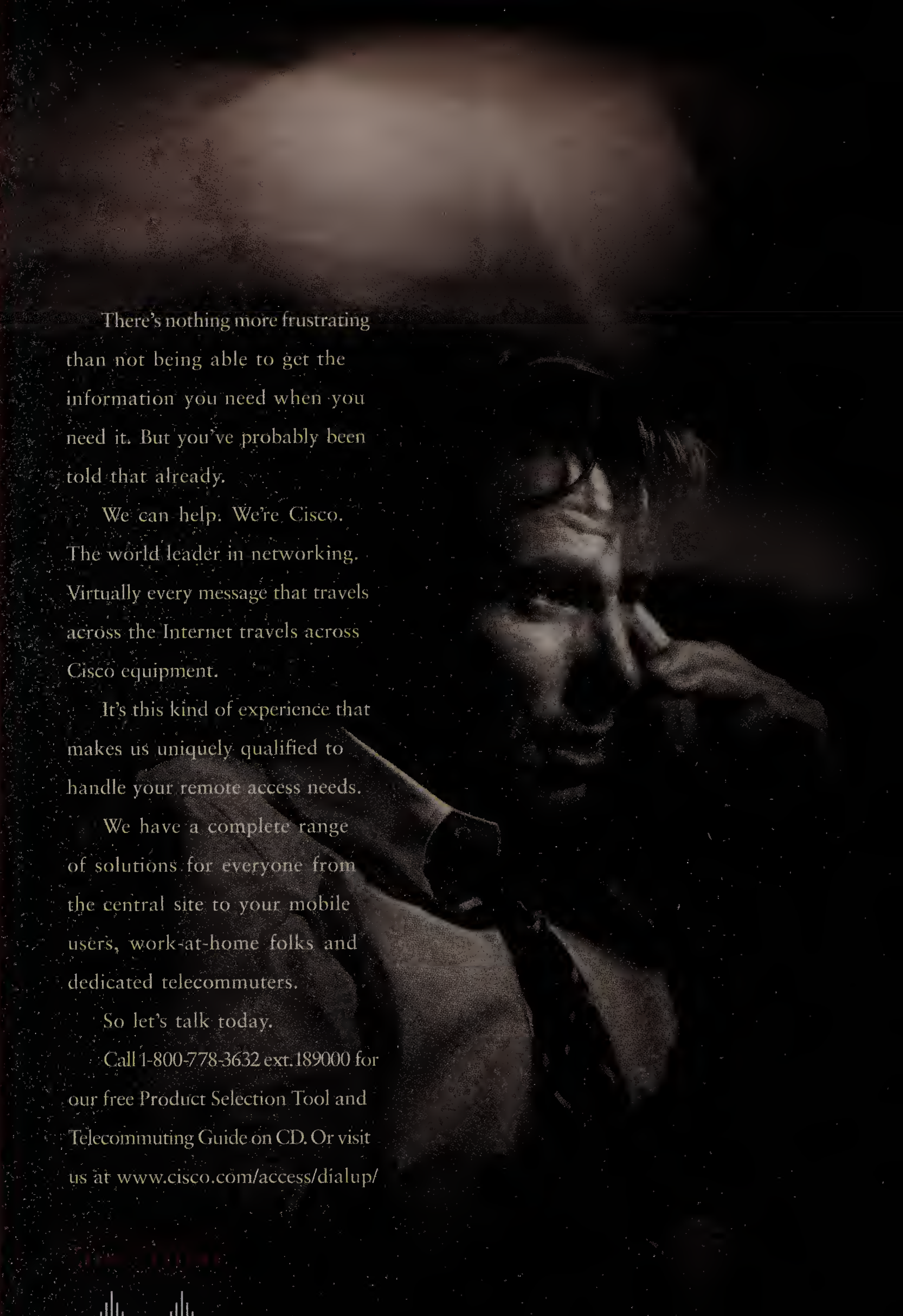

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Briefs

■ **SoftArc, Inc.** *last week announced FirstClass Intranet Server (FCIS), a new product based on the company's flagship FirstClass 3.5* **E-mail and groupware** *package. FCIS provides virtually all of the FirstClass functions, SoftArc said, while supporting a variety of Internet protocols, such as Post Office Protocol 3 and Multi-purpose Internet Mail Extensions. Currently in beta, FCIS is expected to ship in the second quarter and is priced starting at $999 for a 10-user license. FirstClass 4.0 is scheduled to ship in the third quarter.*

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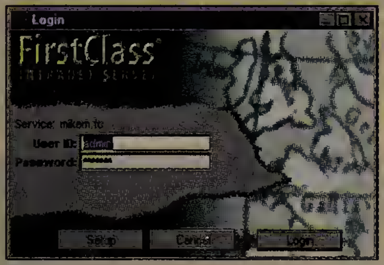

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■ **Web-based workflow vendor Action Technologies, Inc.** *last week released ActionWorks Metro 3.0, a set of* **application and development** *tools that enhance collaboration on intranets and extranets. The new version offers users a single view of their workflow environment and a place to manage all work — regardless of application. The package also includes WorkLinks, which allows users to receive work and status information in their E-mail in-box. Available immediately, Action 3.0 starts at $3,600.*

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■ *New tools for managing IBM MQSeries messaging middleware networks have been released by* **Boole & Babbage, Inc.**

Boole's new AutoOperator lets users automate and view graphically a range of **MQSeries** *functions, such as monitoring message delivery for improved performance.*

It is available now, starting at $18,000.

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Show preview

Taking AIIM at the Web

Vendors to show off document management wares.

By Paul McNamara
New York

Helping corporations make productive business use of the World-Wide Web's wealth of tangled data will be a central topic as the Association for Information and Image Management International (AIIM) conducts its annual conference here this week.

More than 40,000 attendees are expected to hear about and see the latest document management technologies offered by 350 hardware and software vendors.

While the emergence of Web-based solutions holds great promise for corporations, realizing that potential may take awhile, experts said.

"Certainly the Web is having a dramatic effect on the performance of a lot of these companies," said Steven Weissman, president of Kinetic Information, a Waltham, Mass.-based consultancy.

"Their customers have got to figure out a whole new dimension, and it's very confusing. So some slowdown may be expected in some quarters," he said.

Some of the Web-based products being announced at the conference are:

- PC DOCS, Inc. of Burlington, Mass., will unveil CyberDOCS 2.0, a Java-based client that the company claims will provide users with the same document management capabilities found in DOCS Open Power Desktop.
- FileNet Corp. of Costa Mesa, Calif., will show off its forthcoming Web Connector Series, a Web-enabled line of document imaging software.
- Cardiff Software, Inc. of San Marcos, Calif., plans to announce Teleform Internet Solution, which automates the origination, distribution and reading of HTML-based forms.
- Staffware Corp., based in Wellesley, Mass., will introduce Staffware Global, a Web-enabled workflow system for the enterprise that features a graphical development tool and supports any Java-based client environment.

"It has seemed to us for awhile that if anything was going to make the document management market ignite, it was going to be the Web. But it hasn't happened yet," Weissman said. ■

Also being announced at AIIM '97

Company	Announcement	Features
JetForm	JetForm Workflow 2.0, a server-based electronic forms workflow system	Greater integration with production workflow and legacy applications; now supports Microsoft Mail, Exchange 5.0 and Lotus cc:Mail. **Cost: Starts at $2,995 per server.**
Datacap	Paper Keyboard 97, high-end data capture and recognition software	Contains an open set of 32-bit Windows NT- and Windows 95-compliant data capture applications, as well as OLE automation interface.
Diamond Head Software	ImageBASIC for FileNet, a development environment for customized FileNet workflow and imaging applications	16-bit Visual Basic Controls version available immediately; 32-bit ActiveX Controls version due in May. **Cost: $6,000 per tool kit.**
Micro Design International	SCSI Express 3.0, an optical storage solution for Microsoft Windows NT	Company touting easy-to-use tool for attaching and managing optical storage media. **Cost: $3,995-$8,995.**

GemStone readies its Java object server

Software will handle high-volume transactions.

By John Cox
Beaverton, Ore.

GemStone Systems, Inc. soon will begin beta-testing a new Java object application server designed specifically for large-scale, transaction-oriented applications.

The GemStone/J server includes a Java Virtual Machine (JVM), the program that interprets Java code for the underlying computer, rewritten specifically to handle multiple users accessing the same set of objects. The JVM does this by working with a built-in object database and an array of critical application services.

The result, GemStone executives said, is a server-based system that can handle thousands of users, hundreds of gigabytes of data and very complex transactions.

> *"Java is a natural evolution for GemStone. There are other object database vendors adding Java functionality, but of them only Objectivity, Inc. is as closely bound to the Java language [as GemStone]," Duhl said.*

By contrast, standard JVMs lack a local data store, security, transaction controls and other critical services.

Today most, if not all, of these features have to be handwritten or integrated by the developers themselves.

"Right now, we're doing all that in our own software code," said Kurt Guenther, an engineer with a major telecommunications company's object technology group. "If [GemStone's] rewritten JVM handles this, it may be a slick way to do it."

Guenther's company is creating a three-tier Java application, with Java code to run in the browser clients and a middle-tier object layer. GemStone/J will handle session and transaction management and security, Guenther said.

"It's very hard to implement these kinds of services in practice [using homemade code]," he said.

GemStone also will beta-test GemBuilder/J for Beans, which lets software components written to the JavaBeans specification run on the GemStone/J server.

GemStone has licensed the Java Development Kit 1.1 from Sun Microsystems, Inc. — which includes JVM — and modified JVM for multiuser, server-based applications.

GemStone packaged this new JVM with its set of existing server-based transaction, security, administration and data access services.

The package includes an object-oriented database for storing objects locally.

"Java is a natural evolution for GemStone," said Joshua Duhl, principal analyst for Stillpoint Consulting, a Cambridge, Mass.-based company specializing in object-oriented technology. "There are other object database vendors adding Java functionality, but of them only Objectivity, Inc. is as closely bound to the Java language [as GemStone]."

Both products are scheduled for beta release in mid-May and general availability by the end of June.

Prices start at $4,995 per developer for GemStone/J, plus $1,000 per deployment license.

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SHARED LOGIC

Assimilation...Microsoft style

Like the Borg, a fictional civilization from *Star Trek* that assimilates entire races into cybernetic uniformity, Microsoft Corp.'s agents are fanning out across corporate America, absorbing enterprise after enterprise into the world of Windows and Windows NT.

Unlike the Borg, however, Microsoft lacks technology leadership in many areas, faces an increasingly organized opposition and is in no position to replace existing network infrastructures overnight. Major deficiencies include lack of experience and tools for enterprise-level directories, diverse systems integration and clustered high-availability servers.

Microsoft is trying to close some of the gaps through a new partnership with Hewlett-Packard Co. and an existing one with Digital Equipment Corp. Digital and HP have many of the enterprise-level capabilities needed to supplement Microsoft's workgroup expertise. For instance, they can help companies protect their investment in legacy systems and high-end Unix servers or applications and provide tools for scaling NT servers and managing Windows desktops more cost-effectively.

On the messaging front, HP and Digital, as well as Control Data Systems, Inc. (CDS) and others, can help integrate Microsoft Exchange into a multiprotocol messaging backbone and facilitate user migration. Customers could employ Exchange as the messaging server within their NT networks and use HP OpenMail or Digital OfficeServer in the Unix environment, as well as use gateways and directory synchronization technology within CDS' MailHub, Digital's Mailbus and HP's OpenMail.

Daniel Blum

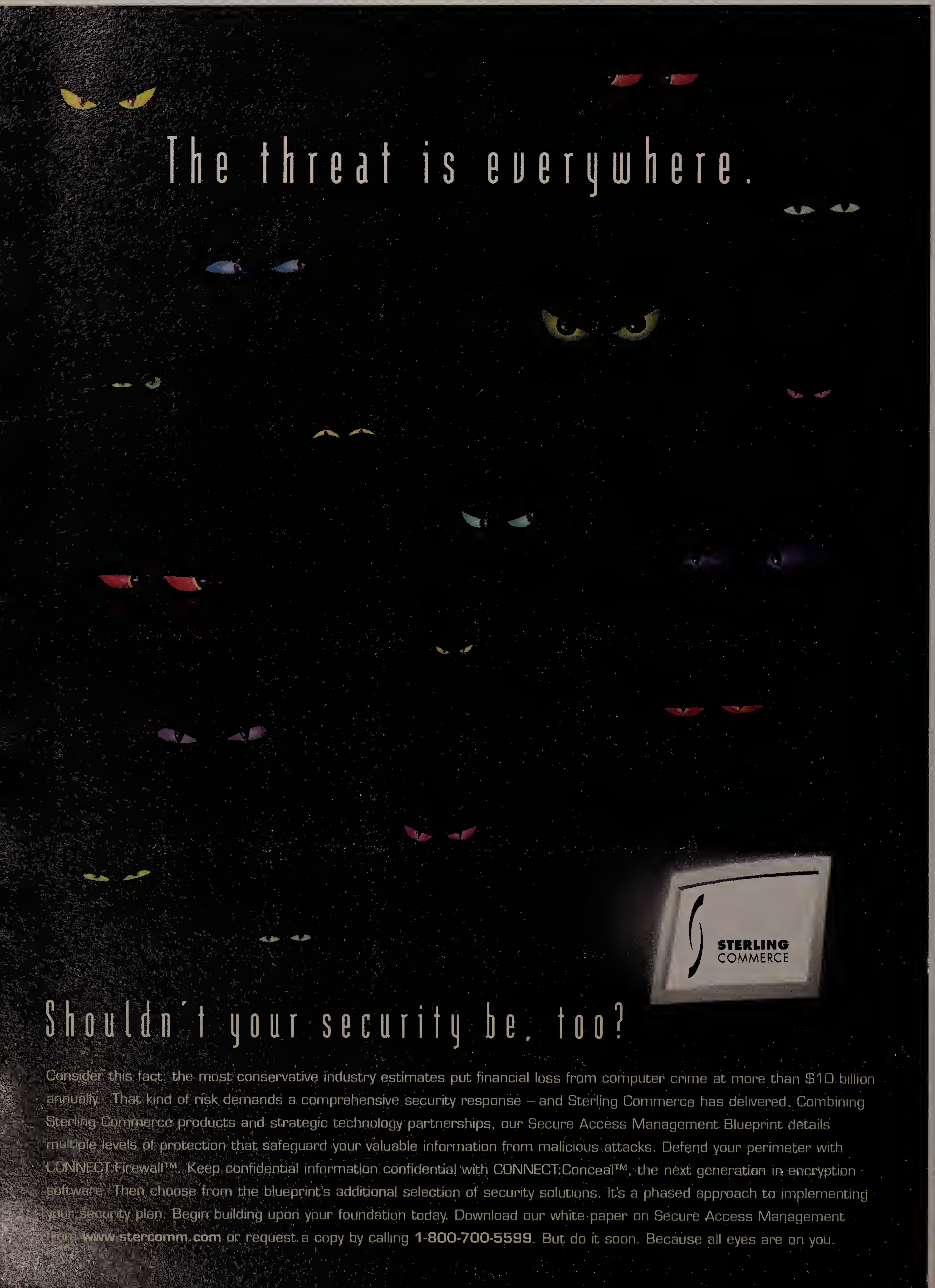
The combined offerings are particularly attractive to distributed organizations that need global support and to organizations that already have a large Digital or HP technology investment. Such customers can safely deploy a mixed solution without worrying about introducing new integration problems. Digital, for example, can enable TeamLinks, Outlook or Exchange clients to access both Exchange and All-in-1 servers, dragging and dropping documents from one server to the other.

Not all parties, however, are content to be assimilated by Microsoft, and they are forming their own partnerships. One of these is Novonyx, the new joint venture between Netscape Communications Corp. and Novell, Inc.

If successful, Novonyx will bring together Netscape's strong market momentum and Novell's installed base of 60 million network customers, which is still much larger than NT's take.

Through this approach, Netscape and Novell hope to counter Microsoft's competitive advantage, which lies in the integration of client- and server-based applications into Microsoft's operating system management, security and — with NT 5.0 — directory elements. Given generous funding, adept marketing and a willingness of the parent companies to set aside GroupWise vs. SuiteSpot feuds, Novonyx could be in place soon enough to provide a counterweight to NT 5.0, the culmination of Microsoft's manageable, object-oriented network promise.

Daniel Blum is a principal at Rapport Communication, a consultancy that focuses on messaging, groupware and electronic commerce. He can be reached via E-mail at dblum@mindspring.com or via the Web at www.rapport.com.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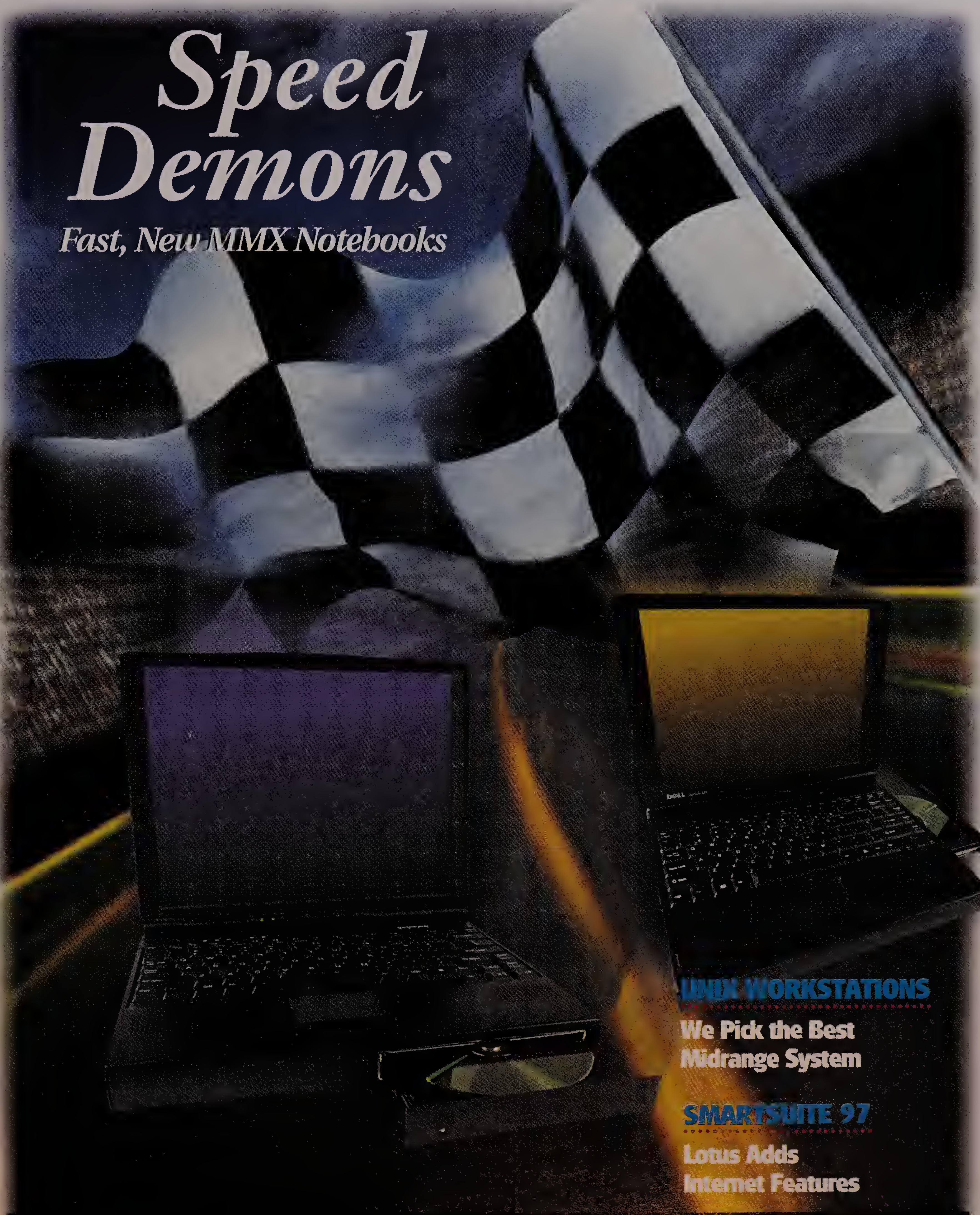
APRIL 14, 1997



Speed Demons

Fast, New MMX Notebooks

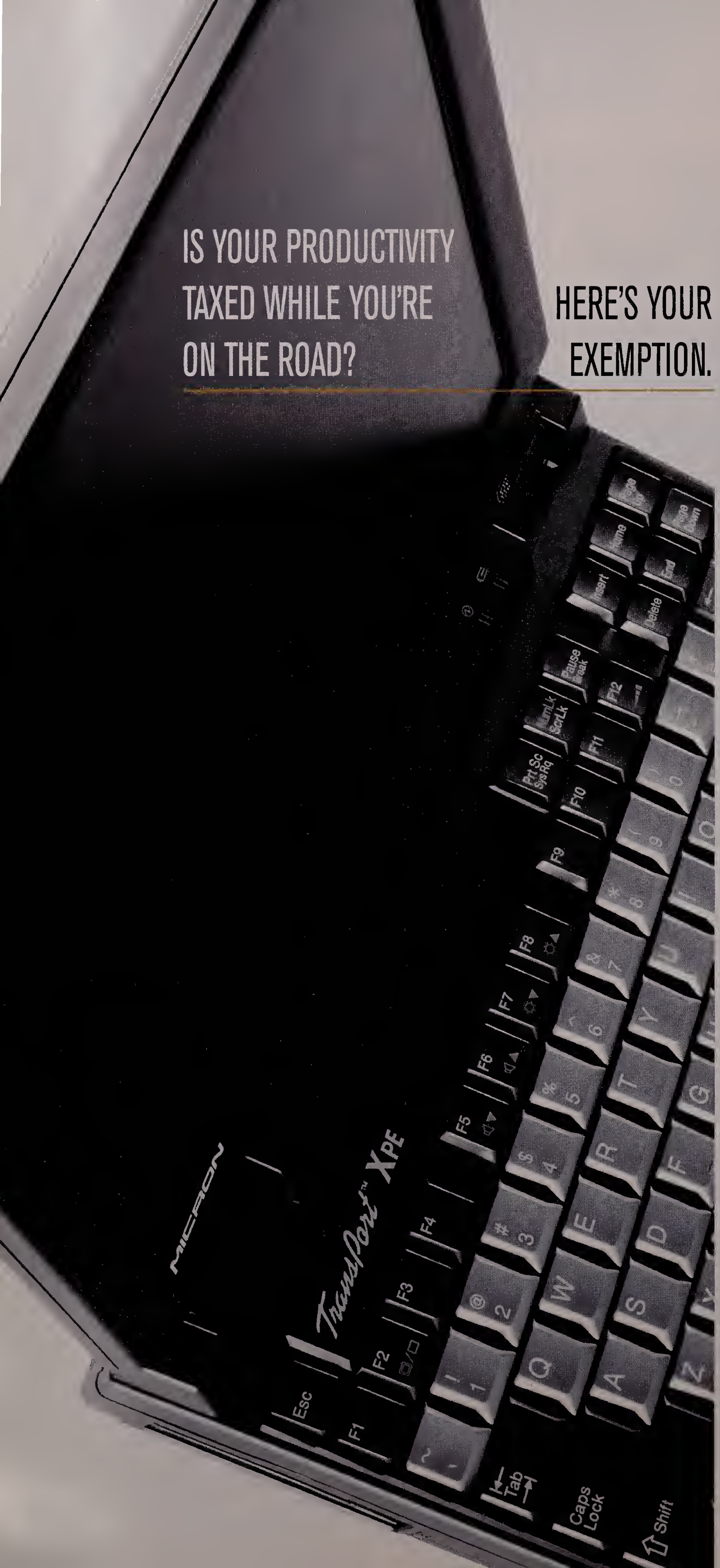
UNIX WORKSTATIONS

We Pick the Best Midrange System

SMARTSUITE 97

Lotus Adds Internet Features

A SPECIAL REPORT TO NETWORK WORLD



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Designed for Microsoft® Windows® 95

PC MAGAZINE EDITORS' CHOICE FEBRUARY 1997 TransPort XPE P166

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COVER STORY

8 *Multimedia Notebooks: MMX Technology Revs Up Performance*

If you need to take video, imaging or communications applications on the road, you should check out the latest multimedia notebooks equipped with Intel Corp.'s new Pentium MMX processor. We reviewed eight systems that all offer solid performance, with a range of features and prices to meet your needs.

SYSTEMS

19 *Unix Workstations: We Pick the Best Midrange System*

Despite the explosive growth of Microsoft's Windows NT operating system, the government remains a strong market for Unix. Check out our review of four Unix workstations in the 200 MHz processor class to see which one offers you the best value.

SOFTWARE

26 *SmartSuite 97: New Version Supports Collaborative Computing Over the Web*

Continuing our regular coverage of office suites, our reviewer has evaluated the latest version of Lotus' SmartSuite. The new version offers improved Internet integration, a revamped central hub and a 32-bit version of 1-2-3.

DEPARTMENTS

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ShareVision PC3000
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30 Acquisition Answer Man
30 Request for Comments

COMING MAY 1997

Videoconferencing

While government agencies have long had access to video teleconferencing rooms, some users could benefit from desktop versions of the technology. Don't miss the FCW Test Center's evaluation of hardware/software systems for LAN-based or remote videoconferencing.

FROM THE EDITOR

Buying a notebook computer, like buying a car, is a very personal decision. Some people want a handy compact. Others want all the bells and whistles of a luxury model, while others favor rugged utility. Add to that the strong opinions people have about input devices — touch-pad vs. trackball — and displays — active-matrix vs. dual-scan passive — and you begin to appreciate the number of subjective criteria involved in evaluating notebooks.

To get a fair assessment of the more personal aspects of the eight Pentium MMX notebooks reviewed in this issue, we conducted "taste tests." We convened a panel of 16 notebook users and asked each of them to rate the features of two notebooks. In particular, we asked them to score the quality of the input devices, the keyboards and the displays. The names of the notebooks were taped over, so the panelists couldn't tell which vendor's equipment they were evaluating. The results are factored in the overall scores found on Page 10.

This isn't the first time we've sponsored taste tests to measure user experiences with products. In the past, we've used panels of users to evaluate the resolution of 17-inch monitors and the output of color laser printers. In fact, the FCW Test Center is the only government-oriented test center that regularly conducts taste tests for IT products.

Conducting a taste test is a time-consuming process. You need to create a test plan and standard sheets for testers to fill out. You need to cajole and coordinate the participants. And you need to calculate the results. But we think the results are important for you to consider in making a buying decision, so we're going to keep incorporating this type of user feedback in our product evaluations whenever it makes sense.

The FCW Test Center was the first to provide government readers with comprehensive product comparisons, and we continue to lead the way with new testing methodologies. Let us know what your experience has been with notebook computers, and we'll post the results on our Web site, **www.fcw.com/pubs/gbb**.

— *Carolyn Duffy Marsan*

OFF THE SHELF

Desktop V Specials

This month only, Hughes Data Systems is offering Air Force buyers a special price on a Digital Equipment Corp. AlphaStation 200 office automation bundle and a Micron Electronics Inc. ClientPro 166 MHz desktop system bundle.

The AlphaStation bundle, based on Digital's 233 MHz 64-bit Alpha processor, comes with 64M of memory, a 2G hard drive, a CD-ROM drive, a 17-inch color monitor, Microsoft Corp.'s Windows NT 4.0 and Office Professional 95. Through the end of April, Hughes is offering this bundled system for $3,599, compared with the $5,544 it would cost to buy the components separately, Hughes said.

The Micron bundle features a 166 MHz Pentium processor, 32M of RAM, a 2.1G hard drive, a 6X (maximum) CD-ROM player, a 3-inch internal floppy drive, a stealth 3-D 2000 64-bit PCI graphics accelerator card, a DMS-ready PC card reader, a 17-inch color monitor, a multimedia kit and Microsoft's Windows 97 and Office Professional 97. The bundle is priced at $2,599, which is almost $700 less than the previous contract price.

Desktop V is open to Defense and civilian agencies. For more information, call (800) 218-2180.

— *John Stein Monroe*

E-Mail Security

Kirkland, Wash.-based Integralis Inc. recently shipped a new version of its MIMEsweeper software, an electronic-mail security package that checks attachments for viruses and other inappropriate content.

MIMEsweeper sits between a firewall and an e-mail system and opens e-mail attachments to search for viruses. Version 3.0 adds support for File Transfer Protocol and Hypertext Transfer Protocol to ensure that information downloaded from other parts of the Internet is not harmful. It also adds the ability to block users from downloading information from particular World Wide Web sites and can perform a keyword search of e-mail content to block inappropriate or sensitive information. This e-mail content manager can also automatically append messages, archive and retrieve messages, and block messages from certain users or certain types of messages. For example, network administrators can block junk e-mail such as a 3M Valentine's Day video that nearly ground some corporate networks to a halt earlier this year.

"This software finds viruses buried in Java applets and scripts as well as zoos, collections of viruses, and cyberwoozles, code that siphens off information about users," explained Victor Woodward, president of Integralis. Woodward admitted that MIMEsweeper slows down e-mail systems slightly but asserted that the package can scan "nine simple messages per second."

The package works with various e-mail packages — including Lotus Development Corp.'s cc:Mail, Microsoft Corp.'s Exchange and Novell Inc.'s GroupWise — and because it supports Simple Mail Transfer Protocol, it can work with any firewall. It also works with all standard Internet browsers, including Microsoft's Explorer and Netscape Communications Corp.'s Navigator, and with a broad range of anti-virus scanning products. It is sold in two parts: MAILsweeper for e-mail security and WEBsweeper for Web and ftp security.

Earlier versions of the software are in use at the Securities and Exchange Commission, the Navy, the Air Force, the Federal Aviation Administration, the Centers for Disease Control and Prevention, and the Education Department. The software is not available on the General Services Administration schedule, but government buyers can purchase it directly or through value-added resellers such as ISM Inc., Rockville, Md. The price for both packages for a 1,000-user LAN is $11,500.

For more information, contact Integralis at (800) 982-6109 or visit the Integralis Web site at **www.integralis.com**.

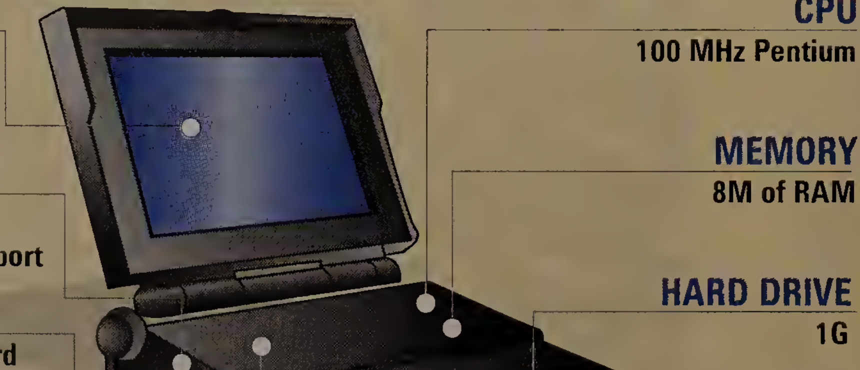
— *Carolyn Duffy Marsan*

FCW test center

HARDWARE HELP

$3,500

If you're going to buy a multimedia notebook computer, here's the minimum configuration we recommend:



SCREEN
12.1-inch active-matrix TFT screen

SOUND CARD
Built-in or PC Card
16-bit sound card support

MODEM
33.3 kilobit/sec PC Card

VIDEO
1M VRAM-expandable

CPU
100 MHz Pentium

MEMORY
8M of RAM

HARD DRIVE
1G

CD-ROM
6X

ACCESSORIES: Sturdy carrying case

*12M to 16M of RAM required for Windows 95

BEST-SELLING SOFTWARE

Feb.	Jan.	Product	Company
1	—	cc:Mail	*Lotus*
2	2	Windows NT Server	*Microsoft*
3	6	Exchange	*Microsoft*
4	4	Windows 95	*Microsoft*
5	5	Windows NT Workstation	*Microsoft*
6	3	FormFlow	*Jetform*
7	8	Office	*Microsoft*
8	7	System Management Server	*Microsoft*
9	10	SQL Server	*Microsoft*
10	1	DOS	*Microsoft*

This list ranks the top 10 software products according to the total number of units sold in February 1997 on the General Services Administration's multiple-award schedule B/C, as compiled by Government Technology Services Inc., the largest GSA reseller.

Computers You Can Wear

Xybernaut Corp., Fairfax, Va., has introduced what some believe to be the next revolution in mobile computing: wearable computers that provide enhanced reality.

This new class of computer, called the Mobile Assistant II, is a hands-free, voiced-activated computer that displays information to users through a small, head-mounted VGA active-matrix display. The CPU and battery pack are attached to a belt that is worn around the user's waist.

The system allows users to view real and computer-generated environments simultaneously without having to turn their heads or remove their hands from machinery or equipment to turn pages in a manual. The entire unit weighs 14 pounds.

According to Xybernaut, this product is well-suited for professionals in the fields of aerospace and military equipment maintenance, health care, inventory control and computer-aided instruction.

The Mobile Assistant II is made up of three subsystems: a processor unit, a head-mounted display and a battery pack. The processor unit is built around a Pentium CPU with 16M of RAM (32M maximum), can accommodate up to 2G of hard drive space and can support Windows, Windows NT, Unix and DOS operating systems. The monocular VGA display measures 1 inch diagonally and provides 640-by-480 resolution as well as tilt, focus, rotation and brightness control. Power options include either rechargeable nickel-metal hydride or lithium-ion batteries, a disposable lithium-ion battery or an AC adapter. Several input and output options are available, such as PC Card, keyboard and video interfaces.

Government buyers can find the Mobile Assistant II on the General Services Administration schedule shortly. For more information, call (703) 631-6925.

— Daniel M. Verton

Software for Fore Users

Fore Systems Inc. switch users now can manage devices seamlessly on their switched internetworks from a single point with ForeView 4.1, which is network management software that allows administrators to manage Fore devices, including Asynchronous Transfer Mode switches, ATM adapters and hubs.

The latest version of the software is available for Unix and Windows NT operating systems. "The biggest features added are those that allow one to manage larger networks," said Richard Bibb, director of Fore's federal operations.

"This is the first release of ForeView that supports client/server architecture. Administrators can manage almost an unlimited number of devices [because] now you have a hierarchical architecture that allows you to scale."

Bibb said the government should be interested in the product because scalability is important as agencies build larger distributed networks. ForeView 4.1 adds capability for global software upgrades via a single point-and-click command, which simplifies downloading new and upgraded software across an enterprise. Also new in Version 4.1 is the ability to provide distributed tracking of network use by keeping track of calls made on a network — something that ATM technology facilitates.

"It gives administrators a better handle on who is using the network and for what" types of applications, Bibb said.

ForeView 4.1 will be available on the GSA schedule held by Bell Atlantic and on other contracts, including Electronic Data Systems Corp.'s Unified Local-Area Network Architecture II and Unisys Corp.'s Scientific and Engineering Workstation Procurement II contract. For more information, contact Warrendale, Pa.-based Fore at (301) 564-4404 or via its Web site at **fore.com**.

— Colleen O'Hara

Portable Presentations

Tired of lugging around high-tech but unwieldy projectors for making presentations? Polaroid Corp., Cambridge, Mass., wants to lighten your load. The Polaview 10 Super Portable LCD Projector, the newest entry in Polaroid's Polaview line of computer-based projectors, weighs less than 10 pounds and folds down to a compact height of 2.9 inches when not in use, so travelers can easily take it on planes, trains or automobiles.

Although sized for the traveling presenter, the projector does not compromise on image quality, according to Polaroid.

The screen displays computer screens or video images at 200 ANSI lumens, which should show up well in poorly lit rooms, the company said.

The Polaview 10 supports 640-by-480 VGA resolution and projects 24-bit color images up to 9 feet diagonally. It comes with stereo speakers and illuminated controls as well as a soft carrying case that also has room for the projector's remote control and the user's portable computer.

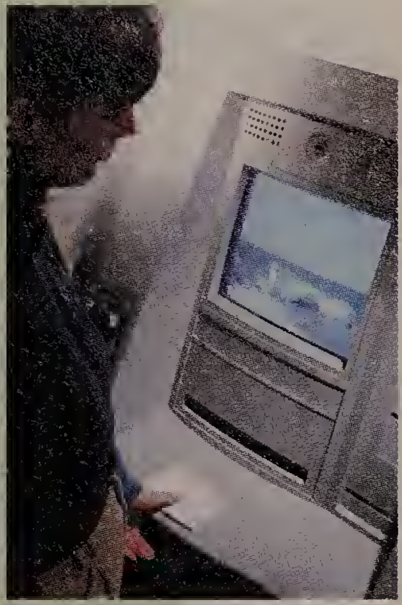
The system is compatible with Windows and Macintosh computers. The retail price is $4,995, but the product will be added to Polaroid's GSA schedule. For more information, call (800) 816-2611.

— John Stein Monroe

STATE AND LOCAL

Help for Probation Officers Checks In

With caseloads on the rise for overburdened New York probation officers, Pacer Infotec Inc. has a solution called CheckIn, an electronic reporting system that allows probationers or parolees to electronically update officers on their progress. The city's Department of Probation recently awarded a $925,000 contract to Billerica, Mass.-based Pacer Infotec for the system to be placed in probation offices throughout the city.



The CheckIn system features Pentium-based multimedia kiosks with video touch screens that prompt probationers to answer a series of questions. The system identifies the users by reading their hand geometry or fingerprints. The system can be programmed with several language options, and it contains a printer to give users a receipt once they've been verified and have answered all the questions. The kiosks also can be fitted with an ambient alcohol device to test for alcohol on a probationer's breath and a magnetic-stripe reader to handle credit cards for probationers owing restitution.

CheckIn also includes a registration kiosk station for use in adding a new probationer. After the kiosk takes the probationer's photo, hand geometry or fingerprints and biographical data and sets up the appropriate questions, the probationer can return on his designated days.

All the information entered in the kiosks goes through a database server and is sent to the appropriate probation officer. The Windows 95- or NT-based case management software program, Officer, resides on the probation officer's desktop PC and can be used to generate reports about an individual's progress, create a map showing where probationers are residing throughout the city or update questions on the kiosk. It also can be configured to send an alarm to the probation officer if a positive alcohol reading is received or if someone the probation officer has been trying to contact directly enters the kiosk system.

"[CheckIn] is the use of state-of-the-art and off-the-shelf technology to better manage growing caseloads," said Jim Cradduck, a consultant for Pacer Infotec. He added that it is not unusual to have 500 to 1,000 cases per probation officer. "This system will give them time to work with high-risk offenders and deal with rehabilitation."

CheckIn is being used by several other municipal and state governments, including the states of Louisiana and Washington and several counties in Minnesota. It is under consideration by officials in Mississippi, Georgia, Florida, California, Massachusetts, New Jersey and Pennsylvania.

Pricing is determined by the size of the system, the number of kiosks, additional features and legacy systems that already exist in an organization. For more information, call (714) 418-0204.

— Dustee Anderson

ShareVision PC3000

PC Videoconferencing

BY LINDA ROHRBOUGH

ShareVision PC 3000, a desktop videoconferencing system from Creative Labs Inc. does more than exchange video images across an analog phone line. It allows you to capture and share images or applications and includes whiteboard capability. I found it time-consuming to install but fun to use, although it wasn't always stable.

Using ShareVision requires at least two units and a phone line. The package comes with a lot of hardware to connect, including two cards to install into your PC. One of the cards is an 8-bit card that acts as the audio and serial communications portion; and the other is a 16-bit card that is the video capture component of the system. Also included is a small video camera (2.5 inches by 4.5 inches by 1.5 inches) and an external Fast .v34 modem that is surprising large (6.5 inches by 10 inches by 1.5 inches). The final component is a small microphone/ear piece unit that fits into a user's ear.

There was a lot of cabling and connecting to do once I got the cards installed into my Pentium PC. Everything is pretty well-labeled, so it wasn't difficult. I had to find outlets for two separate power transformers — one for the video camera and one for the modem.

After the cabling was done, I loaded the Windows 95 version of the software. (ShareVision also comes with Windows 3.1.) The Windows 95 software came on two diskettes, took 3M of RAM and installed quickly.

I was hoping the system would automatically find free interrupts and memory addresses for the COM ports, but it left me to experiment with different combinations. It was better than it could have been, as it allowed me to enter combinations and test them on screen rather than setting switches on the cards themselves. ShareVision also offered suggestions if problems arose during the installation, which I found helpful.

To install ShareVision in my Pentium system, I had to disable the external modem on COM2 but not the serial mouse on COM1. This took several visits to the Windows 95 Device Manager. After I got the communications card working, the video testing program started and worked the first time.

To get ShareVision installed on a second PC, I had to remove a modem/sound combination card. However, the modem that comes with ShareVision is very fast and can be used for other applications.

Here are a couple of helpful tidbits to get ShareVision working: The IRQs, memory addresses and Direct Memory Access channels it defaults to appear in screen shots in Appendix B of the documentation. Also, ShareVision expresses the memory addresses starting with the next odd number.

The bottom line: Be prepared to spend a day getting ShareVision working.

I didn't need any technical support installing ShareVision, but voice, fax and BBS technical support numbers are available. I tried the voice support line first and spent five minutes going through layers of menus before I got to a technical support queue. However, I got to a technician in only seven minutes.

While the video is 15 frames per second, I found that it was less pixelated and better quality using a monitor that displayed 16-bit color (or 64,000 colors) rather than a monitor that displayed 256 colors. I used both types of monitors, however, and the video worked despite the discrepancy.

REPORT CARD

B

ShareVision PC

Creative Labs Inc.
(408) 428-6600
www.creaf.com

Price and Availability

Available on Comark Federal Systems' GSA schedule for $380 each.

Remarks

ShareVision makes videoconferencing a fresh and stimulating experience. The whiteboard capability — using images either drawn, captured or supplied by a video camera — works well. If you plan to perform application sharing, especially under Windows 95, expect the product to be slow. This product is not geared for novice installation, even under Windows 95.

Final Score

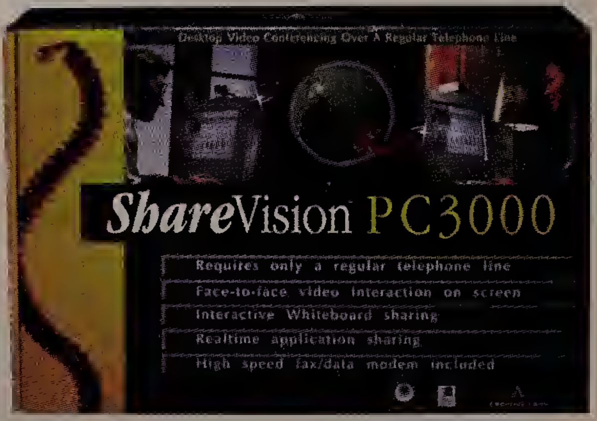
Good

I could vary the size of the video window from about 1.5 inches to 2 inches and could adjust the brightness and contrast. I even could have the camera pan up, down, left or right. Also, there's an s-video connection in the video card that allows input from a video camera as well. I found you could see the full range of the camera by using the "snapshot" feature, which creates a freeze-frame of the video image that's about four times larger than the video windows.

Testing ShareVision

I tested ShareVision by calling someone from Creative Labs and by setting up calls between the two PCs in my office. I ran the product under Windows 95 using a 75 MHz Pentium PC with 24M of RAM to connect to a 486DX2 66 MHz PC with 16M of RAM at Creative Labs that was also running Windows 95. I then used that same Pentium PC to connect to my other PC, a 486DX4 100 MHz with 8M of RAM. Creative Labs recommends as a minimum configuration a 486DX2 66 MHz with 8M of RAM.

When I started ShareVision, I got four windows: two video display windows labeled "Self" and "Remote," a phone dialer that looked like a cellular phone and one with icons for different ShareVision functions, such as the whiteboard. The dialer allowed me to use the mouse to enter phone numbers and then press a "send" button to dial. There's a phone book option that will record numbers, too.


Desktop Video Conferencing Over A Regular Telephone Line
ShareVision PC3000
Requires only a regular telephone line
Face-to-face video interaction on screen
Interactive Whiteboard sharing
Realtime application sharing
High speed fax/data modem included

While the connection was being made, the product displayed the number of seconds I'd been trying to connect in the "Remote" window. The modem offers some sound feedback, so I could tell that the communications session was making progress. Once I was connected, the numbers changed immediately to the image of the other person in the "Remote" window.

I put the earpiece in my ear and heard Ted Choi at Creative Labs say "hello". At 15 frames a second, the video has that jerky Max Headroom quality, but it was better than I'd expected. Ted's microphone was picking up background noise, so he switched to lightweight headphones. Headphones don't come with ShareVision, but if having an object in your ear bothers you, as it does me, then you might consider buying a pair.

Ted suggested I hang up and call back at 21,600 bit/sec instead of the maximum rate of 28,800 bit/sec because the video quality wasn't as good as he thought it should be. The rate adjustment was easily accomplished, and the call went more smoothly at the lower rate.

Ted held a new packaging design for a product in front of the video camera and used the "snapshot" feature to take a freeze-frame image. Then he sent it to me using a file transfer function, and I viewed a progress indicator on screen as the file transferred. The image ended up on the whiteboard, which has drawing tools and allows you to select a drawing instrument and a color. Ted and I chose different colors, but my tool changed to a tiny "stop" sign when Ted was drawing and vice versa.

Ted sent me an image that was captured using a video camera. It was a higher-quality image than the snapshot, and it also took slightly longer to transfer, but we could use the whiteboard drawing tools to draw on the image.

To test application sharing, Ted opened a spreadsheet application in Microsoft Corp.'s Excel. This was much slower and took a long time to draw on my side. Though I had a different version of Excel on my PC, what I was seeing was Ted's version. I was able, once the spreadsheet was on my screen, to make changes to it just as if I were at Ted's PC.

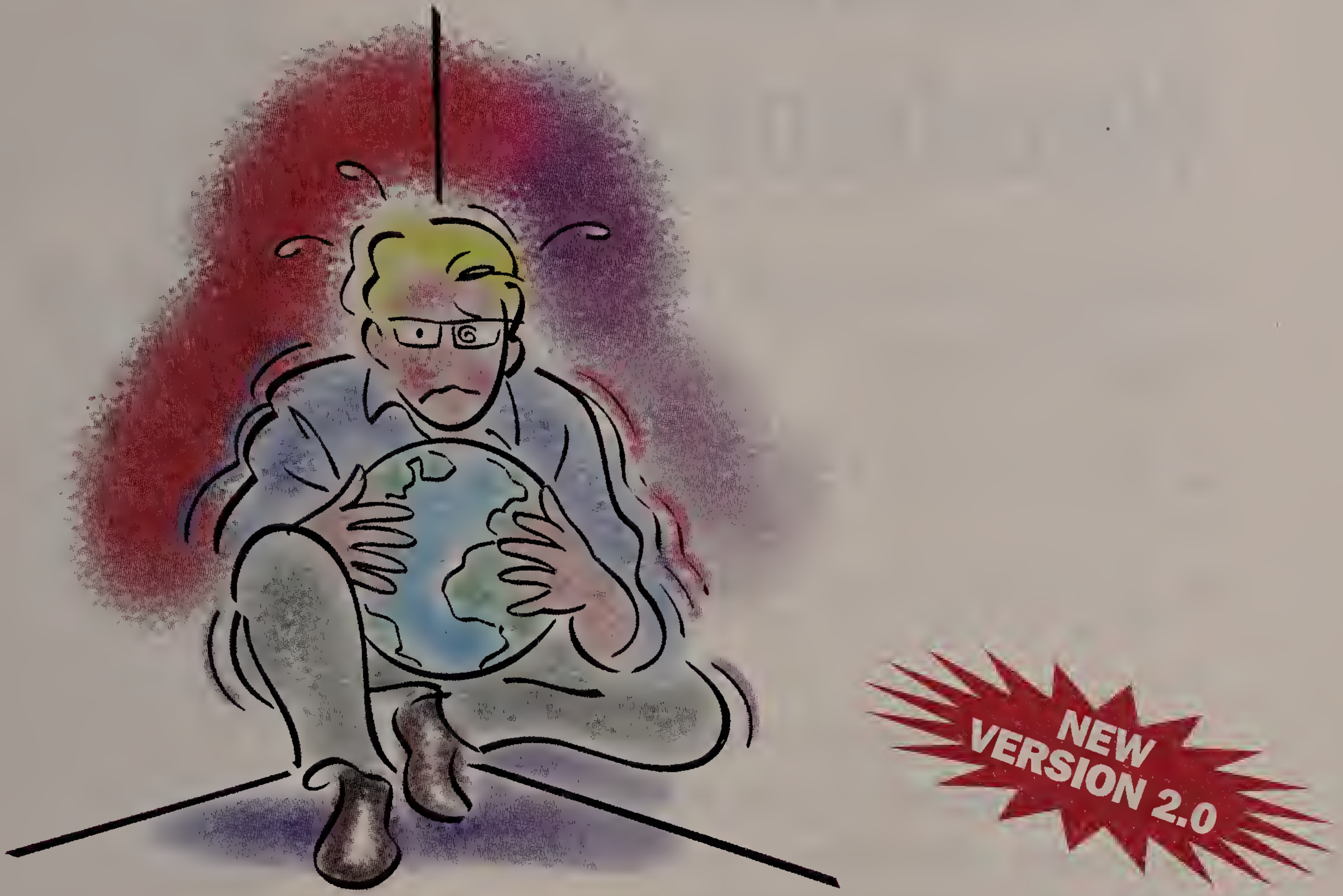
Shortly after I made changes to the spreadsheet, I noticed the video displays stopped updating and froze. When I attempted to move my mouse, I noticed it wouldn't work. We never lost verbal contact, but we determined my PC had locked up and that I would need to reboot and call him back. I tried ctrl, alt, del to shut down just the ShareVision application and exit Windows 95 normally, but the entire system locked up, and I was forced to warm boot. I did call back, and we tried other tasks without incident. Neither system locked up when I called one ShareVision-equipped PC from another in my office.

Creative Labs said the following applications have been tested for sharing with ShareVision: Paintbrush; Write; Microsoft's Word 6.0, MS Excel 4.0 and 5.0, MS PowerPoint 3.0 and 4.0 (but not in slide-show mode) and MS Access 1.10; FileMaker Pro; Corel Corp.'s CorelDraw 5.0; Aldus Corp.'s Photo Styler 2.0; Lotus Development Corp.'s 1-2-3 4.01, Approach 2.1, Ami Pro 3.0, Freelance Graphics 2.0 and Organizer 1.12; Borland International Inc.'s Quattro Pro 5.00; WordPerfect 6.0; QuarkXPress 3.12; and Adobe Systems Inc.'s Photoshop 2.5 and 2.5.1.

Recently, Creative Labs dramatically dropped the price of ShareVision from around $1,500 a pair to less than $400 per unit under GSA schedule pricing. ◀

Award-winning author Rohrbough received the "Best Nonfiction Computer Book" award for 1994. She is author of Upgrade Your Own PC *(IDG, 1996),* Start Your Own Computer Repair Business *(McGraw-Hill, 1995) and* Mailing List Services On Your Home-Based PC *(McGraw-Hill, 1994). You can reach her at 75570.3235 @compuserve.com.*

Can You Defend Your Internet Resources?



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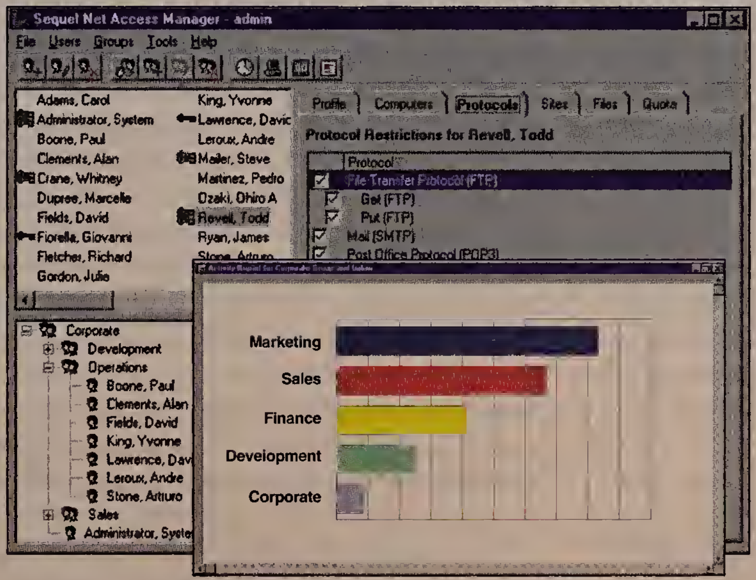

Protocol Restrictions for Revell, Todd

Protocol
- ☑ File Transfer Protocol (FTP)
  - ☑ Get (FTP)
  - ☑ Put (FTP)
- ☑ Mail (SMTP)
- ☑ Post Office Protocol (POP3)

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BEST OF BYTE COMDEX Fall '96
FINALIST

Data Communications LAN Times
BEST OF SHOW 96
FINALIST

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Windows Sources, November 1996

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Multimedia Notebooks

MMX Technology Revs Up Performance

▶ WRITTEN BY DANIEL M. VERTON

▶ TESTING BY ANDREAS UITERWIJK AND CHARLES PETTIROSSI

The newest multimedia notebooks feature something special under the hood: Intel Corp.'s new MMX technology. We clocked the speed of the latest 166 MHz Pentium MMX processors on video and office applications and found significant speedups.

If you need to take video, imaging or communications applications on the road, consider buying one of the new MMX notebooks just hitting the market. Our test center reviewed eight systems: CTX International Inc.'s EzBook, Dell Computer Corp.'s Latitude LM, Digital Equipment Corp.'s HighNote VP, Gateway 2000 Inc.'s Solo, Micron Electronics Inc.'s TransPort XPE, NEC Computer Systems Division's Versa 6200MX, Texas Instruments Inc.'s Extensa 660CDT and Toshiba America Information Systems Inc.'s Tecra 740CDT. All of these units use Intel's new 166 MHz Pentium processor with MMX technology, except for Digital, which offered a 150 MHz version. (Digital will ship a 166 MHz version by press time.)

In fact, if you're a government user looking to buy a high-end Pentium notebook, chances are you'll be forced to purchase MMX technology. That's because most of the vendors we talked to have bypassed the production of standard 166 MHz Pentium systems for new models incorporating MMX technology.

MMX technology was designed to speed up multimedia and communications applications. MMX chips incorporate 57 new instructions and twice the cache. In addition, MMX takes advantage of a technique called Single Instruction Multiple Data (SIMD), which enables the processor to perform one calculation on up to eight data elements simultaneously. This is a major step toward reducing the execution time in audio and video applications.

Our test center has reported that MMX is 10 to 30 percent faster on standard office applications and 40 percent or more faster on MMX-enabled applications [*GBB*, March 3]. Most MMX-enabled applications are games. However, government buyers should look at MMX as investment protection. It's the standard toward which Intel and the rest of the software industry is moving. Furthermore, the technology will come in handy as agencies depend more on multimedia and communications applications.

Today's high-end multimedia notebooks not only offer faster processors, but they also pack loads of new features. Many come bundled with 10X CD-ROM drives, extra-large active-matrix screens and support for the new Zoomed Video (ZV) standard. Multiple PC Card slots are offered, as is a suite of software, including online, communications and graphics applications. Yet all these features are packed in a form factor that weighs as little as 8 pounds.

These systems are designed for the traveling government executive. Many of these notebooks have multipurpose, hot-swappable bays that can accommodate hard drives, CD-ROM drives, floppy drives or a second battery. As a result, users can bring systems on the road that are as powerful as their desktop PCs.

Our choice for the best new MMX notebook was the Solo from Gateway 2000, which received a score of 7.78. It offers competitive performance, which is complemented by high scores in the usability tests. Very close behind the Gateway was the Latitude LM from Dell, posting a final score of 7.74. The systems from CTX and Micron Electronics came in at a tie with 7.55.

Readers should note, however, that the lower scores given to the systems from NEC and Toshiba were largely the result of higher prices. Both of these machines came with the largest active-matrix display available on the market today, and the Toshiba was equipped with a nice complement of videoconferencing equipment.

Visit our Web site at **www.fcw.com/pubs/gbb**, where hotlinks to the vendors mentioned here are available for your convenience.

fcw.com

Gateway 2000 Solo

Gateway was the winner hands-down in our taste-test evaluation and posted solid scores in system design, technical support and weight categories. As a result, its final score of 7.78 was just enough to edge out the Dell system for first place.

The Solo was rated very good for system design. Announced in January of this year, the Solo features a 166 MHz Pentium processor with MMX technology and 256K of pipeline burst L2 cache. The system also ships with 16M of EDO RAM standard, which can be upgrad-

AT A GLANCE

MMX Notebooks

Pricing

Prices range from about $3,300 to more than $6,300 on the GSA schedule.

What's Selling

Many notebook manufacturers have bypassed production of standard 166 MHz Pentium systems in favor of processors with MMX technology.

Where to Find Bargains

Take a close look at the features that come bundled with the system, as this will largely determine price. However, some vendors offer custom configurations to meet your specific needs.

What to Specify

If you need a presentation-level notebook, you may want to opt for a larger screen. For flexibility on the road, look for modular bays that can accommodate multiple components, such as a second battery for extending the life of your system.

ed to 80M — twice that of the Digital system and slightly more than the CTX and Dell machines. Our evaluation unit was tested with 32M of memory.

Although Gateway is following a build-to-order strategy with the Solo, our evaluation unit shipped with standard features, such as a 12.1-inch active-matrix display, 64-bit video with 2M of VRAM, a removable 8X CD-ROM drive, and a removable and modular 3.5-inch floppy drive.The Solo's floppy drive is hot-swappable with a second optional battery pack. The Solo supports a 64-bit graphics engine. Other notable design features of the Solo include full docking capability, a Fast Infrared port, PC Card support for either one Type III or two Type II/I PC Cards and an easily removable 2.1G hard drive. For users concerned with multimedia presentation, the Solo supports 800-by-600 internal screen resolution with up to 65,536 colors and has two integrated stereo speakers located on the system's palm rest.

The Solo's superior look and feel was apparent from its across-the-board scores of very good on our taste test, where we invited eight notebook users to judge the quality of its input devices and display. The layout and responsiveness of the system's 85-key Windows 95-compatible keyboard was a favorite. The Solo also was picked most often as having the best audio/speaker sound of the field.

Gateway received a score of good for setup and ease of use. Our evaluation unit came packed with software. Included were pre-installed copies of Microsoft's Windows 95, Office 7.0, Bookshelf 95 and Money 4.0, as well as Corel Corp.'s Professional Photos, MOSAIC, CD Audio and PhotoCD Lab applications, Franklin Quest Co.'s Ascend personal planner software and America Online, CompuServe and Prodigy on-line services applications. Gateway also ships system drivers for its own version of irMonitor along with Traveling Software Inc.'s LapLink for Windows 95 on CD-ROM and diskette.

The Gateway system posted the second-fastest rating for Business Applications Performance Corp.'s SYSmark/32 benchmark, with a score of 155, just seven points behind the Micron. Solid scores in desktop graphics, desktop presentation and spreadsheets were responsible for the Solo's competitive performance. On Intel's Media Benchmark, the Solo managed to squeeze out a fourth-place finish with a score of 206.60, still significantly ahead of the systems from Toshiba and Texas Instruments.

There are few differences between the Gateway and Dell systems. However, users seemed to prefer the Gateway's keyboard layout and sound/audio capabilities. But you'll have to shell out a few extra dollars for the Solo. The system is currently priced at $4,242.

Dell Latitude LM

Dell's Latitude LM finished a hair behind the Gateway system with a slightly lower score in system design and fewer points on the keyboard layout and sound/audio portions of the taste test. When all was said and done, the Dell system finished with a final score of 7.74.

System design for the Latitude LM was rated good. The Latitude ships with a 166 MHz MMX Pentium processor with 256K of L2 cache memory and comes with 16M of RAM standard via FastPage Small Outline Dual Inline Memory Modules (SO DIMM) that can be upgraded to 72M. Our test unit shipped with 40M of memory.

A small and relatively inconspicuous infrared port is located on the back right corner of the system chassis. The system's back panel shields a passthrough port replicator, a 9-pin serial port, a bidirectional parallel port and a connector for a 15-pin external VGA adapter. The system's PC Card slot supports either one Type III or two Type II/I PC Cards. The 2.1G hard disk can be easily removed via a bottom access panel. The 3.5-inch floppy drive is also removable.

THE CONTENDERS

- ▶ **CTX International Inc.'s EzBook**, available on the GSA schedule. **Score: 7.55**
- ▶ **Dell Computer Corp.'s Latitude LM**, available on the GSA schedule soon. **Score: 7.74**
- ▶ **Digital Equipment Corp.'s HighNote VP**, available on the GSA schedule. **Score: 6.90**
- ▶ **Gateway 2000 Inc.'s Solo**, available on the GSA schedule soon. **Score: 7.78**
- ▶ **Micron Electronics Inc.'s TransPort XPE**, available on the GSA schedule. **Score: 7.55**
- ▶ **NEC Computer Systems Division's Versa 6200MX**, available on the GSA schedule. **Score 7.43**
- ▶ **Texas Instruments Inc.'s Extensa 660CDT**, available on the GSA schedule. **Score: 7.10**
- ▶ **Toshiba America Information Systems Inc.'s Tecra 740CDT**, available on the GSA schedule. **Score: 6.95**

For the multimedia enthusiast, the Latitude provides a 10X CD-ROM drive and 12.1-inch TFT active-matrix display with 800-by-600 maximum resolution and support for 65,536 colors. Two small speakers are located to the front of the keyboard and are fed by an ESS Technologies Inc. 16-bit Sound Blaster-compatible sound card. Video support is provided by a NeoMagic Corp. 128-bit graphics engine with 1M of VRAM.

The Latitude we received came in a sleek black case that weighed just over 8 pounds — the lightest in the review. Users liked its screen display best but preferred the keyboard layout of the Gateway, NEC and Micron machines. The system ships with an 87-key Windows 95-compatible keyboard and uses an integrated touchpad for mouse functionality. Color-coded function keys let users manipulate audio volume and screen lighting or place the unit in suspend mode.

The Latitude earned a rating of good for setup and ease of use. Our evaluation unit shipped with Windows 95 pre-installed and also came bundled with several other software titles. Included were Microsoft's Office and Bookshelf 95, WinComm PRO 7.0, WinFax PRO 7.0 and America Online. Dell also provides an on-line user guide that covers topics such as power management, maintenance and customer support. We found the system's power management settings easy to configure through the BIOS setup.

With the Latitude LM, Dell continues its reputation for producing fast machines. A very good score of 152 on the SYSmark/32 benchmark places the Latitude in fourth place for performance. However, it finished out front on Intel's Media Benchmark with a score of 210.75.

A decent price and good performance make the Latitude LM a good buy. Once again, Dell has provided a system capable of posting solid scores across the board. The Latitude LM is not yet available on the General Services Administration schedule. However, buyers can purchase it on the open market for $4,091.

CTX EzBook

Some unique features, such as a bundled headset and status indicator panel, along with the lowest price in the comparison, helped the EzBook tie for third place with an overall score of 7.55 on our scale of 1 to 10.

The system's 166 MHz MMX Pentium processor is supported by 256K of L2 cache and up to 72M of EDO RAM. Our evaluation unit was tested with 40M of memory installed. The EzBook currently only supports a 1G hard drive, but CTX is testing a 2G drive for the unit.

The standard features of the EzBook include an infrared port for wireless communications, PC Card support for either one Type III or two Type II/I cards, a 15-pin MIDI/game port, an RCA TV jack, full docking or port replication capabilities, a removable floppy drive and an internal 6X CD-ROM drive. The system also provides for an optional second lithium-ion battery pack that can be installed in the CD-ROM bay.

A 12.1-inch display is the focal point for the EzBook's multimedia capabilities. The system supports 800-by-600 resolution and up to 64K colors. Graphics are run by a 128-bit NeoMagic PCI graphics engine with 1M of video memory. Integrated stereo speakers, external microphone and speaker ports, and audio input ports are also included.

We gave the CTX EzBook a score of good for setup and ease of use. Our evaluation unit came pre-loaded with Windows 95, Claris Works 4.0, Microsoft Plus, America Online, CompuServe and AT&T WorldNet. CTX also provides users with a CD-ROM containing various system drivers, utilities and a very helpful demonstration. However, upgrading the EzBook's memory is slightly more complicated than most of the other systems. Users must remove the keyboard panel, take out the heat pipe and then remove the memory card. In addition, the hard drive is held in place by standard screws and a mounting bracket that makes upgrading the drive more time-consuming.

A weight of 8 pounds, 13 ounces puts the EzBook on par with the rest of the field, as do decent scores on our taste test. The EzBook attracted the third-highest number of votes for keyboard layout, finishing one point behind the NEC system. Users also rated the screen and audio quality of the EzBook as good.

The CTX system fared even better on our performance evaluation, scoring a powerful 153 on the SYSmark/32 benchmark. However, the extra 8M of RAM may have boosted performance slightly. It also was the second-place finisher on the Intel Media Benchmark with a score of 208.81 — less than two points behind the first-place Dell machine.

Overall, the CTX EzBook is a solid system that performs very well. If speed is what you're concerned with, this system ranks right up there with the leaders. Improvements in documentation, support policies and compatibility will definitely make this machine a contender for the first-place position in our reviews. The CTX EzBook is priced at $3,369 on the GSA schedule.

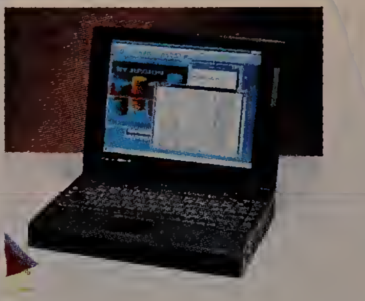
Micron TransPort XPE

Although Micron Electronics' TransPort XPE tied for third place overall with a score of 7.55, it was the fastest system in our review. It also posted a notable performance on the keyboard layout portion of the taste test. Micron also introduced a government tech support line (800-876-9158), pushing its score up a few points.

Micron offers the TransPort XPE in either 150 MHz or 166 MHz MMX Pentium processor configurations. Our evaluation unit shipped with a 166 MHz MMX processor with 256K of L2 pipeline burst cache memory and 32M of EDO DRAM (16M standard).

The TransPort XPE received a score of very good for system design. It was the only system to ship with two

166 MHz Pentium MMX Notebooks Compared



	WEIGHTING	EzBook	Latitude LM	HighNote VP*	Solo
Company		**CTX International Inc.** **(800) 888-2017** **www.ctxintl.com**	**Dell Computer Corp.** **(800) 727-1100** **www.us.dell.com/federal/**	**Digital Equipment Corp.** **(800) 700-5899** **www.cop.dec.com**	**Gateway 2000 Inc.** **(800) 846-2000** **www.gw2k.com**
Tested Configuration		1G hard drive, 40M of RAM, 12.1-inch screen	2.1G hard drive, 40M of RAM, 12-1-inch screen	1.4G hard drive, 40M of RAM, 12.1-inch screen	2G hard drive, 32M of RAM, 12.1-inch screen
SYSmark/32	100	153 **94.44**	152 **93.83**	142 **87.65**	155 **95.68**
Intel Media Benchmark	50	208.81 **49.54**	210.75 **50.00**	182.63 **43.33**	206.60 **49.02**
Battmark**	75	127 **61.85**	152 **74.03**	132 **64.29**	131 **63.80**
Notebook Weight***	75	★★★ **60.00** 8 lbs., 13 oz.	★★★ **60.00** 8 lbs., 4 oz.	★★★ **60.00** 8 lbs., 11.6 oz.	★★★ **60.00** 8 lbs., 5.8 oz.
Setup/Ease of Use	75	★★☆ **45.00** System came pre-loaded with Windows 95, Claris Works 4.0 and Microsoft Plus. On-line services include AOL, CompuServe and AT&T WorldNet. CTX included a CD-ROM with various system drivers and utilities. The user guide is available on-line. Hot keys on the keyboard place the system in full suspend or standby mode. The hard drive is secured with screws and a mounting bracket, making it difficult to replace.	★★☆ **45.00** Dell provides an on-line user's guide and a comprehensive listing of service phone numbers with the Latitude LM. The system's hard drive can easily be removed, and memory modules can be installed via a bottom access panel. The system also shipped with a good complement of applications: Cyberjack 7.0, AOL, Microsoft's Bookshelf and Office, WinComm PRO and WinFax PRO 7.0.	★★☆ **45.00** In addition to Windows 95, the Digital system ships with Adobe Acrobat 2.1, AOL 2.5, LapLink for Windows 95, QuickTime for Windows, Personal Journal, SkyTel Access and Slide Show. Microsoft's system disk backup utility is automatically launched during initial boot-up. Users can put the system to sleep while the LCD is open by pushing the system's power button once. We found upgrading the memory relatively simple.	★★☆ **45.00** In addition to Windows 95, the Solo came bundled with Corel's Professional Photos and MOSAIC applications, CD Audio, PhotoCD Lab, Franklin's Ascend personal planner software, AOL, Prodigy and CompuServe. A utility CD-ROM and disks house operating system, touchpad, video and sound drivers. On-line documentation is provided for the system's 33.6 fax/data modem.
System Design/ Expandability	130	★★★ **104.00** The design includes an infrared port, support for one Type III or two Type II/I PC Cards and a removable floppy drive. An optional second battery pack can be installed in the CD-ROM bay. Extra points were earned for the headphone/microphone headset. The 166 MHz MMX processor is backed up by 256K of L2 cache, 1G of hard drive space and up to 72M of EDO RAM. Supports NTSC/PAL TV video.	★★☆ **78.00** The Latitude LM's design supports many good features, including a 12.1-inch TFT active-matrix LCD, infrared communications, PC Cards, a removable floppy drive, a 10X internal CD-ROM drive and stereo speakers. In addition, the 166 MHz MMX processor is supported by 256K of pipeline burst L2 cache and a maximum of 72M of DIMM memory.	★★☆ **78.00** The HighNote VP provides a 12.1-inch SVGA active-matrix display, a Fast Infrared port, support for one Type III or two Type II/I PC Cards, a removable floppy and a 6X CD-ROM drive, port replication and a 1.44G hard drive. The HighNote was the only system in the review with a 150 MHz MMX processor. It was supported by 256K of L2 cache and a maximum memory capacity of 40M.	★★★ **104.00** Full-docking capability, up to 2G of hard drive space and a maximum of 80M of memory helped Gateway earn a score of very good. The system also offers a Fast Infrared port, PC Card support, removable floppy drive and 8X CD-ROM drive. The system's 166 MHz MMX processor comes with 256K of cache memory. Supports NTSC/PAL TV video.
Compatibility	50	★★ **20.00** Supports Windows 95 and NT. Currently testing OS/2, and Unix will be available soon. CTX doesn't sell DOSxx or Windows 3.x.	★★☆ **30.00** Supports Windows 3.x, 95, NT and DOSxx. Windows 3.x and DOS 6.22 are not offered as factory-installed options.	★★☆ **30.00** Supports Windows 3.x, 95, NT and DOSxx.	★★☆ **30.00** Supports Windows 3.x, 95, NT and DOSxx.
Screen Quality	40	★★☆ **24.00**	★★★ **32.00**	★★☆ **24.00**	★★★ **32.00**
Keyboard/Mouse Quality	40	★★★ **32.00**	★★☆ **24.00**	★★☆ **24.00**	★★★ **32.00**
Sound Quality	40	★★☆ **24.00**	★★☆ **24.00**	★ **8.00**	★★★ **32.00**
Documentation	50	★★ **20.00** No quick-start guide included with system. The documentation is very comprehensive in its coverage; however, poor readability detracted from an otherwise very good rating.	★★★ **40.00** No quick-start guide. All documentation is provided on-line except for a separate trouble-shooting guide. The on-line search function key is very useful for finding information.	★★☆ **30.00** A very useful 3-step quick-start guide was provided in six languages. The system manual does not include a glossary but provides a brief trouble-shooting section. Overall, documents were well laid out and easy to read.	★★☆ **30.00** Although there's no quick-start guide or glossary, the documentation is well-organized and provides a very good trouble-shooting section. We also liked the diagrams that were included in the system manual.
Technical Support	50	★★★ **40.00** Technical support was very good, with minimal hold times. Our questions were fielded with ease by CTX's technical representatives.	★★★ **40.00** Minimal hold time, and technical support representatives were able to assist us with little or no problem.	★★★ **40.00** We received very good technical support from Digital this time around. Minimal hold times.	★★★ **40.00** Hold time of 10 minutes was pushing it, but technical support was still very good. Our questions were answered with little or no problem.
Support Policies	75	★★ **30.00**	★★★ **60.00**	★★ **30.00**	★★☆ **45.00**
Warranty		1 year	3 years	1 year	1 year
On-Site Service		None	None	Must qualify for MCS program****	None
Money-Back Guarantee		30 days	30 days	No	30 days
Fax-Back Support		Yes	Yes	Yes	Yes
Toll-Free Line		Yes	Yes	Yes	Yes
Other Support		In-house BBS, Internet	In-house BBS, CompuServe, Internet, AOL, Prodigy	In-house BBS, CompuServe, AOL, Prodigy, Internet	In-house BBS, CompuServe, AOL, Prodigy, Internet
Support Hours		8:30 a.m. — 5:30 p.m. M-F (PST)	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days
GSA Price (as of March 21)	150	$3,369 **150.00**	$4,091 (open market) **123.54**	$4,022 **125.65**	$4,242 **119.13**
Reseller		AmeriData Federal Systems	Dell	Digital	Gateway 2000
GSA No.		GS-35F-3013D	GS-35F-4076D	GS-35F-0137D	GS-35F-33490
Phone		(800) 374-9434	(800) 727-1100	(800) 354-9000	(800) 846-2000
Final Score	1000	**7.55**	**7.74**	**6.90**	**7.78**
Remarks		**CTX's benchmark performance is comparable to the leaders. We're looking for improvements in compatibility, documentation and support policies.**	**Once again, Dell provides a high-quality system capable of fast performance at a reasonable price. Design features were just shy of putting it over the top.**	**A good price and competitive performance scores make this 150 MHz system a solid buy.**	**Gateway wins our comparison with a combination of the best taste test scores and a nice design.**

Products receive ratings from excellent to unacceptable in certain categories. Scores are derived by multiplying the weighting of each criterion by its rating, where:

★★★★ = Excellent = 1.0 Outstanding in all areas
★★★ = Very Good = 0.8 Meets all essential criteria and offers significant advantages
★★☆ = Good = 0.6 Meets essential criteria and includes some special features
★★ = Satisfactory = 0.4 Meets essential criteria
★ = Poor = 0.2 Falls short in essential areas
● = Unacceptable = 0.0 Fails to meet minimum standards or lacks a feature

Scores are summed, divided by 100 and rounded down to two decimal places to yield the final score out of a maximum score of 10.0 (plus bonus). Products rated within 0.2 points of one another differ little.

All notebooks contained the following:
- Internal CD-ROM drive
- Internal floppy disk drive
- Built-in stereo speakers
- Battery pack
- External power supply

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* The HighNote VP contained a 150 MHz Pentium MMX processor.
** Battery tests were run twice: once at custom settings and once at default settings. The higher score is listed here.
*** Notebooks were weighed with batteries, CD-ROM drives, floppy disk drives and AC adapters.
**** Digital's Multivendor Customer Services.
***** Free while under warranty
****** Price includes 28.8 kilobit/sec data/fax modem.

TransPort XPE		**Versa 6200MX**		**Extensa 660CDT**		**Tecra 740CDT**	
Micron Electronics Inc. **(800) 438-3343** **www.micron.com**		**NEC Computer Systems Division** **(415) 528-6000** **www.nec.com**		**Texas Instruments Inc.** **(800) TI-TEXAS** **www.ti.com/notebook**		**Toshiba America Information Systems Inc.** **(800) 477-1616** **www.toshiba.com/tais/csd/products**	
2G hard drive, 32M of RAM, 12.1-inch screen		**2.1G hard drive, 32M of RAM, 13.3-inch screen**		**2.1G hard drive, 32M of RAM, 11.3-inch screen**		**2.1G hard drive, 32M of RAM, 13.3-inch screen**	
162	**100.00**	132	**81.48**	101	**62.35**	138	**85.19**
207.25	**49.17**	190.77	**45.26**	142.73	**33.86**	173.35	**41.13**
103	**50.16**	108	**52.60**	150	**73.05**	154	**75.00**
★★★ 8 lbs., 14.6 oz.	**60.00**	★★☆ 9 lbs., 8 oz.	**45.00**	★★★ 8 lbs., 9.9 oz.	**60.00**	★★ 10 lbs., 2.8 oz.	**30.00**
★★☆ The TransPort comes with a good bundle of software applications pre-loaded, but the keyboard lacks power management and suspend controls, and there are no utilities shipped with the unit. Software titles include FocalPoint communications suite, LapLink for Windows 95, Microsoft Bookshelf and Office, Quicken SE, AOL, Internet Explorer, CompuServe and AT&T WorldNet.	**45.00**	★★★ NEC's convenient power management control allows users to change their settings without having to enter the BIOS. In addition to Windows 95, the system came pre-loaded with NEC's customer support guide and Que Corp.'s "Using Windows 95" utility. Other applications included AudioRack 32, LapLink for Windows 95 and McAfee VirusScan95 and WebScan. Netscape Navigator was also provided but was not installed.	**60.00**	★★★ System loaded with Windows 95 and a demonstration utility. Also loaded is a standard Windows 95 user's guide. Users can place the system in sleep mode and access power management settings by pressing a hot-key combination on the keyboard. Technical support and service phone numbers are also provided on-line.	**60.00**	★★☆ Extensive list of pre-loaded applications. Users can choose to install Windows 95 or MS-DOS and Windows for Workgroups. System also comes with on-line documentation. A standard system disk maker icon is also provided. For novice users, the Tecra provides a good multimedia tutorial on the desktop. Help and support phone numbers can also be found on-line.	**45.00**
★★★ This system is capable of storing two 3G hard drives, and it includes both pointing stick and touchpad mouse devices. It also incorporates two infrared ports. Other features include support for two Type II or one Type III or two CardBus cards, a 12.1-inch active-matrix display and 2M of VRAM. The 166 MHz MMX processor is supported by 256K of cache memory and up to 80M of RAM. Supports NTSC/PAL TV video.	**104.00**	★★★★ NEC has a 13.3-inch TFT active-matrix displays, and it supports two Type II/I or one Type III PC Cards (ZV-ready). Supports a second battery that can be changed while the notebook is in suspend mode. The 10X CD-ROM drive is Photo CD-compatible. In addition to the 166 MHz MMX processor with 256K of L2 cache, the system can support up to a 4.2G hard drive, up to 128M of RAM and 2M of VRAM. Supports NTSC/PAL TV video.	**130.00**	★★★ The 11.3-inch TFT Super VGA display provides 64K color support. System features include a Fast Infrared port, support for two Type II/I or one Type III PC Cards, a modular and interchangeable 10X CD-ROM drive, floppy drives and support for port replication. TI's 166 MHz MMX processor has 256K of L2 cache and is supported by a 2.1G hard drive, up to 80M of EDO RAM and 1.5M of VRAM.	**104.00**	★★★★ This is the only system to use a trackpoint pointing device and an internal 28.8 fax/modem. A 13.3-inch active-matrix screen and a full set of videoconferencing hardware and software is included. System supports two Type II/I or one Type III PC Card, an internal 10X CD-ROM, a 2.1G hard drive and up to 144M of RAM. The system's 166 MHz processor has 256K of SRAM cache.	**130.00**
★★☆ Supports Windows 3.x, 95, NT and DOSxx.	**30.00**	★★☆ Supports Windows 3.x, 95, NT and DOSxx.	**30.00**	★★ Supports Windows 3.x, 95 and DOSxx.	**20.00**	★★☆ Supports Windows 3.x, 95, NT (in May 1997) and DOSxx.	**30.00**
★★☆	**24.00**	★★★	**32.00**	★★☆	**24.00**	★★★	**32.00**
★★★	**32.00**	★★★	**32.00**	★★☆	**24.00**	★★	**16.00**
★★☆	**24.00**	★★	**16.00**	★★☆	**24.00**	★★	**16.00**
★★ No quick-start guide, but the user's guide has a section on getting started. Contact and support numbers were listed in the front of the manual. No trouble-shooting section, and the illustrations could be better.	**20.00**	★★★★ Three-step quick-start guide provided. NEC also includes a helpful pocket-size quick-reference manual. Well-organized documentation includes a very good glossary and trouble-shooting section.	**50.00**	★★☆ No quick-start guide, but the user's manual provides a section on getting started. Trouble-shooting section provides limited coverage of basic notebook problems. Overall, documentation is well-organized and readable.	**30.00**	★★★★ All manuals are written by Toshiba, and they include a comprehensive user's guide and manuals for every hardware or software item that ships with the system. Documentation is easy to read and understand.	**50.00**
★★★ Micron offers a new priority technical support hot line for government users. We experienced no hold times, and the reps were knowledgeable.	**40.00**	★★★ Minimal hold times were complemented by friendly, helpful and knowledgeable technical representatives.	**40.00**	★★★ Technical support was very good with almost no hold time.	**40.00**	★★ Technical staff was friendly, knowledgeable and helpful, but we experienced excessive hold times (13 to 14 minutes) and busy signals.	**20.00**
★★★ 3 year None 30 days Yes Yes In-house BBS, internet 24 hours, 7 days	**60.00**	★★☆ 3 years None None Yes Yes In-house BBS, CompuServe, AOL, Microsoft Network, Internet 8:30 a.m. — 8:30 p.m. M-S (EST)	**45.00**	★★ 1 year None None Yes Yes In-house BBS, Internet 24 hours, 7 days*****	**30.00**	★★☆ 3 years (1 year on battery) No None No Yes In-house BBS, CompuServe, Internet 24 hours, 7 days	**45.00**
$4,314 Micron GS-35F-4317D (888) 665-5339	**117.12**	$6,013 NEC GS-35F-32160 (800) 632-4636	**84.04**	$4,049****** AmeriData Federal Systems GS-35F-3013D (800) 374-9434	**124.81**	$6,368 Toshiba GS-35F-33040 (800) 477-1616	**79.36**
	7.55		**7.43**		**7.10**		**6.95**
Micron offers a speedy system and a preferred look and feel. The new government-only technical support line is very responsive.		**NEC provides high-quality multimedia. Users should not shy away from the slightly slower benchmark results.**		**Although a bit slower on the benchmarks, our taste testers still liked working with the system. Overall, a solid machine.**		**Although you will pay more for this system, it's packed with features. Look closely to see if Toshiba has what you're looking for.**	

infrared ports, located on the front and back of the unit. It also was the only system to offer users the flexibility of choosing either the touchpad or pointing stick for mouse functionality. However, only one device can be used at a time. The PC Card interface supports either two Type II/I or one Type III PC Cards and is ZV-ready. Micron also offers the MicronDock for desktop functionality as well as additional battery and hard drive options for use in either of two swappable bays. The system we tested shipped with a 2.1G hard drive standard.

Graphics are powered by a 64-bit engine from Cirrus Logic Inc. and 2M of VRAM. Additional multimedia features include a 16-bit Sound Blaster-compatible sound card, a 10X CD-ROM drive (although some units ship with an 8X CD-ROM drive standard) and two integrated stereo speakers located on the system's palm rest. The TransPort's 12.1-inch active-matrix display supports 800-by-600 resolution and up to 65,536 colors.

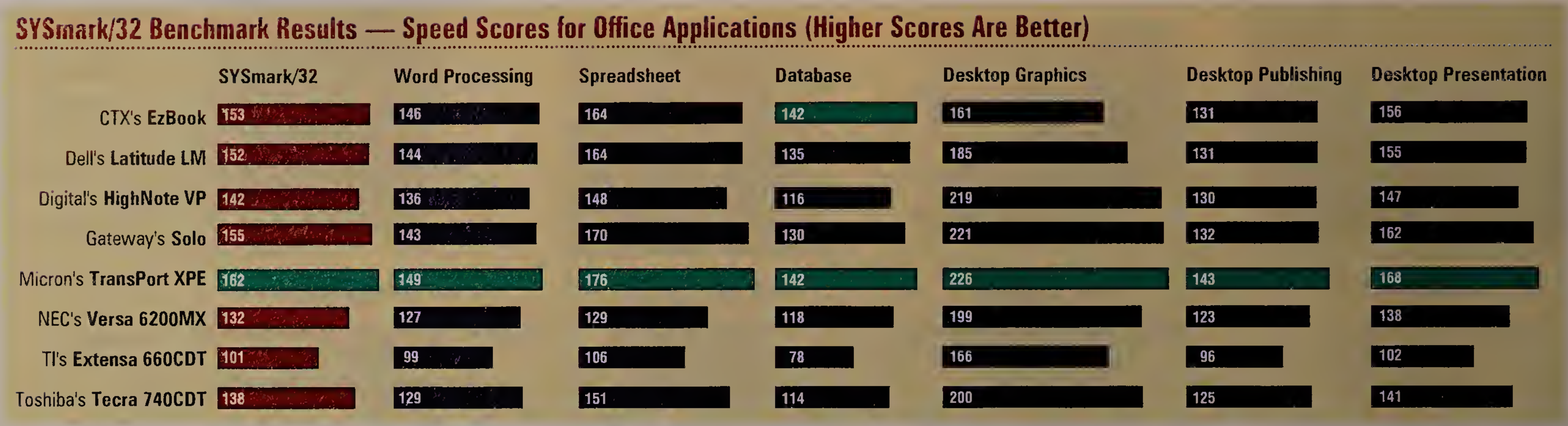
The TransPort XPE comes in a thin, sleek, solid black case. The 85-key, Windows 95-compatible keyboard comes in two shades of gray to differentiate between letter keys and function or control keys. The system did relatively well in our taste test, with many users preferring the TransPort's keyboard and mouse layout over that of the Dell, Digital, Toshiba and Texas Instruments machines. It did not do as well, however, on the screen and sound/audio portions of the test but was still competitive.

The TransPort's CPU and system board architecture may have helped it pull away with the title of fastest notebook, scoring a 162 on the SYSmark/32 benchmark. In fact, the Micron took first-place honors in every category of SYSmark/32, except for database, where it tied the CTX system. It also scored 207.25 on Intel's Media Benchmark, placing it in third place for this test.

The TransPort XPE is a top-notch performer and a good value. Its overall design is similar to the Gateway, although its screen and sound quality were not as popular. The TransPort XPE is priced at $4,314 on the GSA schedule.

NEC Versa 6200MX

Excellent system design and solid results in our taste test helped power the NEC Versa 6200MX to a fourth-place finish with a score of 7.43 on our scale of 1 to 10. The Versa 6200MX comes with a 166 MHz MMX Pentium processor with 256K of cache memory. The system also


SYSmark/32 Benchmark Results — Speed Scores for Office Applications (Higher Scores Are Better)

ships with 32M of EDO DIMM memory standard and can be upgraded to a whopping 128M — second only to the Toshiba Tecra. The system we tested came with 32M of memory.

NEC named the Versa 6200MX after one of the more prominent aspects of its design: its versatility. The system's VersaBay II slot allows users to "warm swap" the floppy drive, CD-ROM drive, a second hard drive or a second battery while the system is in suspend mode.

The 6200MX comes with a Fast Infrared port located on the front right corner of the unit, which some users may find cumbersome to work with when transferring files to another system. The PC Card slot provides support for either two Type II/I or one Type III PC Card and is ZV-ready for more efficient video processing. The 6200MX also provides mobile users with full docking station capability with NEC's optional Docking Station 6000 Plus. In addition, the Versa PortBar 6000 option offers an alternative approach to the docking station by simply providing connectivity to desktop peripherals. Finally, in addition to the second hard drive capability (for a total of 4.2G of storage), each drive can be loaded with a different operating system and individually selected as the boot device.

Along with the Toshiba system, the 6200MX provided one of the largest screens of the field with a 13.3-inch XGA display. Resolution is 1,024-by-768 with up to 64K colors supported. Additional multimedia support includes 16-bit audio, hardware-assisted MPEG for full-motion video support, a 10X CD-ROM drive and 2M of VRAM.

The system's steel-gray finish is pleasing to the eye. The 85-key Windows 95-compatible keyboard is well-positioned, and mouse functionality is provided by NEC's VersaGlide touchpad. Individuals who took part in our taste test liked the user functionality of the 6200MX, giving it competitive scores for screen quality, keyboard/mouse layout and sound/audio quality. At 9 pounds, 8 ounces, however, the system is a little heavier than some of the others.

We gave the 6200MX a rating of very good for setup and ease of use. Our evaluation unit came pre-loaded with Windows 95 and a good complement of software titles. Included were McAfee Inc.'s VirusScan95 and WebScan, Microsoft NetMeeting, LapLink for Windows 95, Netscape Navigator (not installed), AT&T WorldNet, America Online and CompuServe. NEC also loads its customer support guide and Que Corp.'s guide to "Using Windows 95."

On our performance tests, the NEC system was not one of the faster machines, finishing in seventh place with a score 132 on the SYSmark/32 benchmark. It performed slightly better on Intel's Media Benchmark, placing fifth with a score of 190.77. However, both of these scores are very good, so users should not shy away from these results.

The 6200MX will provide high-quality multimedia processing to traveling professionals. In addition, its modularity and flexibility make it easy to use while on the road. However, at $6,013 on the GSA schedule, it's priced significantly higher than the competition.

Texas Instruments Extensa 660CDT

As we were conducting this review, we learned that Acer America Corp. had agreed to buy Texas Instruments' TravelMate and Extensa notebook computer product lines. The deal was expected to close on or before March 31. As of this writing, however, the Extensa 660CDT still belongs to Texas Instruments, as does its final score of 7.10 on our scale of 1 to 10.

The Extensa received a score of very good for system design. Our evaluation unit shipped with a 166 MHz MMX Pentium processor with 256K of L2 cache memory and 32M of EDO RAM. The system, however, ships with 16M of RAM standard and can be upgraded to 80M.

The features we found on the Extensa included a Fast Infrared port, PC Card support for either two Type II/I or one Type III cards (ZV-ready on the bottom slot), a 2.1G hard drive, port replication capability, and removable and interchangeable 3.5-inch floppy and 10X CD-ROM drives. The Extensa's modular bay can accept either the floppy drive, CD-ROM drive or a second battery.

A 128-bit NeoMagic graphics engine runs the video with the help of 1.5M of EDO video memory. In addition, Texas Instruments provides Mediamatics' software MPEG player (Arcade Player). The system also comes with 16-bit stereo sound that plays through two integrated speakers, as well as external speaker, microphone and sound input ports.

We gave the Extensa a score of very good for setup and ease of use. Windows 95 came pre-loaded on our evaluation unit, along with a demonstration program describing the system's features and instructions on how to use it. There was also an on-line version of standard Windows 95 documentation, and the demonstration program provided various contact numbers for support. We also found the ROM-based power management features of the Extensa to be easy to use and helpful.

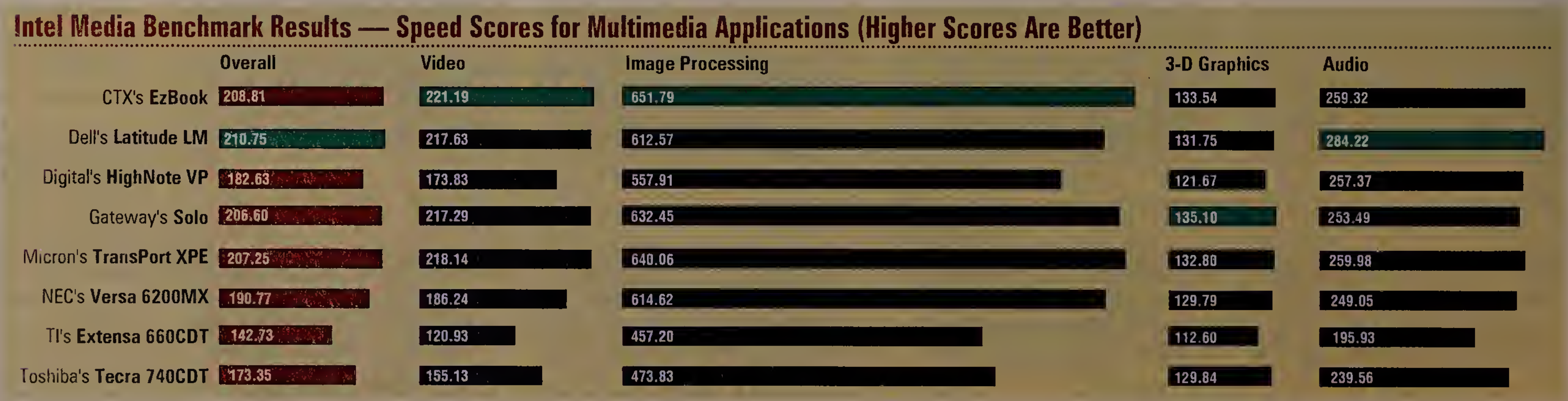
The look and feel of the Extensa earned scores of good across the board on our taste test, which judged screen quality, keyboard/mouse layout and audio quality. Weighing in at 8 pounds, 9 ounces also makes the Extensa competitive with the rest of the field.

A score of 101 on the SYSmark/32 benchmark placed the Extensa in last place for benchmark performance. It also finished in last place on Intel's Media Benchmark, with a score of 142.73.

Although it's a bit slower than the other systems in terms of its benchmark performance, the Extensa still posted solid scores from our taste testers. Improvements in system compatibility and vendor support policies will also help out this machine in future comparisons. For the time being, buyers can purchase the Extensa 660CDT for $4,049 on the GSA schedule. This price includes a 28.8 kilobit/sec modem.

Toshiba Tecra 740CDT

Although the Toshiba Tecra 740CDT was more expensive than the rest, it had a few extra features that help explain its price. In addition to being one of two machines with a 13.3-inch screen, the Tecra comes with an internal 28.8 data/fax modem and supports a videoconferencing package that Toshiba also bundles with


Intel Media Benchmark Results — Speed Scores for Multimedia Applications (Higher Scores Are Better)

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- Glidepoint mouse
- Lithium Ion battery
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this system. These additions make a statement about Toshiba's vision of MMX-based mobile computing and helped it earn a 6.95 score.

The Tecra we received for evaluation came with a 166 MHz MMX Pentium processor with 256K of L2 cache memory. Although we tested it with 32M of RAM, the system ships with 16M standard and can be upgraded to support 144M.

The feature-packed Tecra received a score of excellent for system design. The large 13.3-inch active-matrix display supports 1,024-by-768 resolution and up to 64K colors. The Tecra ships with many of the same features noted in the other notebooks, such as a standard infrared port located on the rear panel, sound and microphone ports, PC Card support for either two Type II/I or one Type III PC Cards and full docking station capabilities. The system offers a 2.1G hard drive as well as interchangeable internal floppy and 10X CD-ROM drives. It also supports an external floppy connection. However, the Tecra only supports one battery at a time, so users will need to carry spares.

As mentioned earlier, the Tecra's multimedia features are highlighted by a full complement of videoconferencing equipment. Included are a mountable camera, videoconferencing software and a set of headphones. In addition, a software-based MPEG player comes bundled with the system and is supported by a 64-bit graphics engine with 2M of video memory.

We gave the Tecra a rating of good for setup and ease of use. Windows 95, Windows for Workgroups or MS-DOS operating systems come pre-loaded. Other pre-installed applications include Intel's ProShare videoconferencing software, America Online, CompuServe, Netscape Navigator Personal Edition and Puma Technology Inc.'s TranXit. The system also ships with on-line documentation and Toshiba's custom utilities.

The Toshiba was the heaviest unit at 10 pounds, 2.8 ounces. The look and feel of the system was marked by its steel-gray finish and large, brilliant screen display that users found very appealing in our taste test. However, they were not as happy with the keyboard layout and the audio capabilities of the Tecra, ranking both satisfactory.

Battmark Performance Results — Battery Life* (Higher Scores Are Better)

	Custom Battmark	Elapsed Runtime (Hours, minutes, seconds)	Loops Completed
CTX's **EzBook**	127	2:12:14	2.92
Dell's **Latitude LM**	152	2:30:44	3.42
Digital's **HighNote VP**	132	2:16:24	3.01
Gateway's **Solo**	116	1:56:14	2.48
Micron's **TransPort XPE**	103	1:44:16	2.18
NEC's **Versa 6200MX**	108	1:57:18	2.35
TI's **Extensa 660CDT**	111	1:53:02	2.34
Toshiba's **Tecra 740CDT**	154	2:34:05	3.43

	Default Battmark	Elapsed Runtime (Hours, minutes, seconds)	Loops Completed
CTX's **EzBook**	113	1:58:57	2.57
Dell's **Latitude LM**	152	2:30:44	3.42
Digital's **HighNote VP**	115	1:55:35	2.47
Gateway's **Solo**	131	2:15:09	3.00
Micron's **TransPort XPE**	87	1:37:24	1.10
NEC's **Versa 6200MX**	97	1:41:33	1.96
TI's **Extensa 660CDT**	150	2:35:14	3.44
Toshiba's **Tecra 740CDT**	63	1:07:09	1.18

*Higher scores used in evaluation.

A score of 138 on the SYSmark/32 places the Tecra ahead of the systems from NEC and Texas Instruments. However, it only placed seventh on Intel's Media Benchmark, with a score of 173.35. Of all its performance results, the Tecra's desktop graphics score of 200 was its best and was competitive with the leading Micron, Gateway and Digital systems.

Priced at $6,368 on the GSA schedule, the Tecra 740CDT costs more than competing models, but it also provides unique features such as the videoconferencing hardware and software. If you require these extra goodies, the Tecra is a good system to buy.

Digital HighNote VP

Although Digital provided the only 150 MHz machine of the review, as of this writing the company is planning for the introduction of a 166 MHz model. Despite its slower processing speed, the HighNote VP still performed well, scoring a 142 on the SYSmark/32 benchmark, beating out the 166 MHz systems from NEC, Texas Instruments and Toshiba. Its final score was 6.90.

The Digital system earned a rating of good for system design and expandability. The 150 MHz Pentium processor with MMX technology is backed up with 256K of external cache memory and a standard 8M of EDO DIMM memory that can be upgraded to 40M. Because the HighNote VP shipped with a slower processor, we installed two 16M memory upgrade modules in our evaluation unit for a total of 40M. The added memory may have helped boost the system's performance, which was higher than some of the 166 MHz systems.

FCW test center

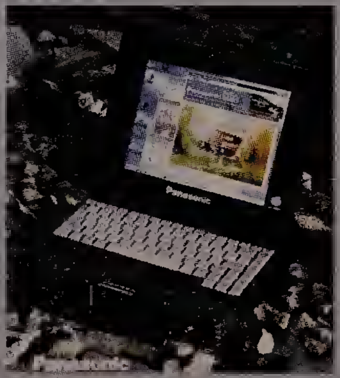
NOTES FROM THE TEST CENTER

Panasonic's Ruggedized CF-25

DANIEL M. VERTON

At first glance, Panasonic Communications & Systems Co.'s CF-25 notebook computer looks like a steel-reinforced miniature briefcase. But, in fact, it's a Pentium PC encased in a hardened magnesium alloy that is 20 times stronger than plastic. Panasonic offers 100 MHz, 120 MHz, 133 MHz and 150 MHz models. We tested a unit with a 133 MHz processor, 16M of EDO RAM and a 1.35G hard drive.

The CF-25 offers some unusual features in terms of ruggedization. The LCD is mounted and sealed in an anti-torsion water- and dust-resistant magnesium frame. The keyboard and touchpad are also sealed for maximum protection against moisture. Even the system's speaker, located directly below the base of the LCD, is positioned to minimize exposure to water. Port and jack covers are lined with rubber sealing to prevent water and dust from damaging internal circuitry. However, the most unique aspect of the CF-25 is its use of a special proprietary shock-absorbing gel that encases the hard disk and floppy drive. According to Panasonic, the CF-25 was designed to meet Military Standard 810E for shock resistance.



To see how rugged this system is, we dropped the unit from a desk measuring approximately 2.5 feet in height. After three drops, the unit continued to boot up and operate without error. In fact, during one of these drops the unit was running and experienced no interruption in processing. We also exposed the CF-25 to a moderate amount of water, simulating a spilled beverage and light rainfall. During both tests, the system continued to operate without a problem.

In addition to the CF-25's ruggedized features, Panasonic incorporated an infrared port for wireless communications with peripheral devices and a PC Card slot (Zoomed Video port ready) that supports either three Type II or one Type III and one Type II PC Cards. The side-mounted 3.5-inch floppy drive is easily removed from what Panasonic calls the Multimedia Pocket by pushing a slide release mechanism on the bottom of the unit. The pocket also can accommodate an optional Panasonic 10X CD-ROM drive.

Opening the cover reveals a 10.4-inch TFT active-matrix color LCD and an 87-key Windows 95-ready keyboard. The LCD supports 800-by-600 SVGA resolution and 65,536 colors. Mobile users will appreciate the system's ergonomic design, which features a sturdy, wide palm rest area and easy-to-use touchpad.

As far as software is concerned, users will get pre-loaded copies of Windows 95, Panasonic's power management utilities and Puma Technology Inc.'s TranXit V3.0 IrDA port control software as well as SystemSoft Corp.'s Cardworks PC Card software.

The CF-25's performance results on our benchmark tests were mixed. We tested the system using Business Applications Performance Corp.'s SYSmark/32 performance benchmark and Battmark battery tester. The system scored a 70, which is average.

As far as the staying power of the CF-25's battery, our evaluation unit ran for 1 hour, 5 minutes, 34 seconds, scoring a 60 on the Battmark/95. This is significantly below the 2 to 2½ hours advertised by Panasonic.

The CF-25 is a perfect match for mobile users who require a reliable, rugged system to crank out their workload in a fast-paced, harsh environment. It is available on the GSA schedule from GTSI Inc. (GS-35F-4120D) for $3,726.

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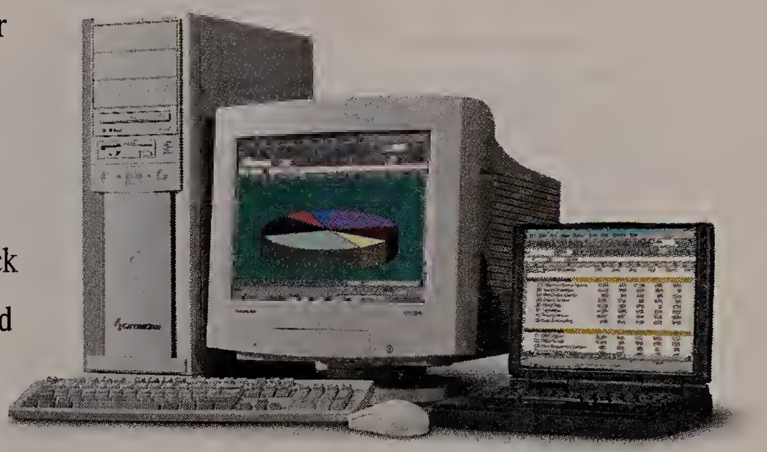

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*For fiscal year 1996, according to Federal Computer Week, Government Technology Group.

Sample GSA Configurations

Professional Systems

P5-133

- Intel® 133MHz Pentium® Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron®500 (13.9" viewable) Color Monitor
- 2MB SGRAM
- 1GB EIDE Hard Drive
- 3.5" Diskette Drive
- 12X CD-ROM Drive
- 7-Bay Mini Tower Case
- 104+ Keyboard
- Microsoft® IntelliMouse™
- MS® Windows® 95
- MS Office 97, Small Business Edition plus Bookshelf® 96†
- 3-year limited warranty**

$1594

P5-166

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron700 (15.9" viewable) Color Monitor
- 2MB SGRAM
- 2GB EIDE Hard Drive
- 3.5" Diskette Drive
- 12X CD-ROM Drive
- 7-bay Mini Tower Case
- 104+ Keyboard
- MS IntelliMouse
- MS Windows 95
- MS Office 97, Small Business Edition plus Bookshelf 96†
- 3-year limited warranty**

$2021

G6-200

- Intel 200MHz Pentium® Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron700 (15.9" viewable) Color Monitor
- 4MB SGRAM
- 2GB SCSI Hard Drive w/Controller
- 3.5" Diskette Drive
- 12X SCSI CD-ROM Drive
- 3Com® 10/100 Fast Ethernet Network Card
- 12-Bay Tower Case
- 104+ Keyboard
- MS IntelliMouse
- MS Windows NT® 4.0
- MS Office 97, Small Business Edition plus Bookshelf 96†
- 3-year limited warranty**

$3054

Gateway Solo™ Portable PC

2100 S5-120

- 11.3" Dual Scan SVGA Color Display
- 120MHz Pentium Processor
- 16MB EDO DRAM expandable to 72MB
- 256K Pipelined Burst Cache
- 1MB EDO Video RAM
- 1GB Hard Drive
- Modular 8X CD-ROM Drive
- Modular 3.5" Diskette Drive
- 16-Bit Sound & Stereo Speakers
- Lithium Ion Battery & AC Pack
- 85-Key MS Windows 95 Keyboard
- Casual Carrying Case
- MS Windows 95
- MS Office 97, Small Business Edition plus Bookshelf 96†
- 1-year limited warranty**

$2443

†MS Office 97,
Small Business Edition
MS Word 97, MS Excel 97, MS Publisher 97, MS Outlook™ 97, MS Automap® Streets Plus, Bookshelf 96

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GSA Schedule #GS-35F-3349D

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intel inside
pentium PROCESSOR

The HighNote VP offers a solid list of features. A user-configurable expansion bay allows for the loading of either the standard 3.5-inch floppy drive, 6X CD-ROM drive or an optional second smart lithium-ion battery. The system's 1.44G hard drive can also be easily accessed and removed via a front access panel. Opening a left side access panel reveals a PC Card interface that supports either one Type III or two Type II/I cards. Additional interfaces include an RS-232C serial port, an enhanced parallel port, a Fast Infrared port operating at 115 kilobit/sec, an SVGA monitor connector and an expansion port for a mini dock port replicator option (Ethernet connection optional).

The look and feel of the HighNote VP is highlighted by an 11.8-inch-wide chassis that supports an 85-key, Windows 95-compatible keyboard. Our taste-test users liked the keyboard and mouse layout. However, they rated the quality of the unit's sound system as poor. Mouse functionality is provided by a touchpad.

Further enhancing the overall experience is a 12.1-inch SVGA TFT color LCD for up to 800-by-600 resolution and up to 64K colors.

The system's desktop graphics score of 219 was powered by a 128-bit PCI local bus graphics engine with a NeoMagic MagicGraph 128v controller and 1M of VRAM. The HighNote VP also boasts support for full-screen, full-motion MPEG video that runs at 30 frames per second. A 16-bit Sound Blaster-compatible audio card from ESS Technologies provides the system's stereo sound.

Digital earned a score of good for setup and ease of use. Our evaluation unit arrived with Windows 95 preloaded and a slew of additional applications, including America Online 2.5, CompuServe, LapLink for Windows 95 and Apple Computer Inc.'s QuickTime for Windows. Users will appreciate the system's ROM-based power management control and the fact that the system automatically prompts users to create system backup disks upon boot-up.

The 16M RAM upgrade kit we installed in the HighNote VP apparently boosted its performance enough for it to beat out several of the machines with faster processors. Scoring a 142 on the SYSmark/32 benchmark, the Digital finished slightly above the systems from NEC, Texas Instruments and Toshiba. It also did relatively well on the Media Benchmark from Intel, scoring a 182.63.

The HighNote VP is available to government buyers for $4,022 on the GSA schedule.

Summary

With the systems from Gateway and Dell having finished so close to one another, buyers will have to decide whether the few extra features of the Gateway system are worth the slight difference in price. However, if you need a bigger screen and advanced multimedia features, you might want to consider the Toshiba and NEC systems, which are high-end units but carry higher prices.

Regardless, all of these machines performed well. The differences to look for are in features and price. ◀

HOW WE TESTED

MMX Notebooks

Our tests were designed to reflect the notebooks' performance and feature differences. We used two benchmarks: Business Applications Performance Corp.'s SYSmark/32 for office applications; and Intel Corp.'s Media Benchmark, which measures performance on MMX-enabled applications. Both tests were designed to emulate tasks users run in real-world business environments.

Performance

We scored each test mathematically. The fastest system running SYSmark/32 received the maximum number of points possible (100), while the fastest system running the MMX benchmark received the maximum number of points possible (50). All other units received a percentage of the maximum points based on their slower performance.

The SYSmark/32 benchmark test measures the performance of eight popular business applications: Microsoft Word 7.0, Lotus WordPro 96, Microsoft Excel 7.0, Borland Paradox 7.0, CorelDraw 6.0, Lotus Freelance Graphics 96, Microsoft PowerPoint 7.0 and Adobe PageMaker 6.0. The Intel Media Benchmark Release 1.0 measures video, image processing, 3-D graphics and audio performance using applications written to take advantage of Direct X 2 Processing. The elapsed times of these applications are combined to produce a SYSmark/32 score and an MMX mark. Because these scores are a rate (work divided by time), higher numbers indicate better performance.

Battery Life

We scored battery life mathematically; the system with the largest Battmark number received all the points possible (75). All other units received a percentage of the maximum points based on their lower Battmark scores. The notebook total battery runtime and the amount of work completed are included to come up with a Battmark score.

The applications are: Microsoft Word 7.0, Lotus WordPro 96, Microsoft Excel 7.0, Borland Paradox 7.0, PowerPoint 7.0, Microsoft Schedule+ and Games-Free Cell (32-bit version). The battery test machine consists of robotic arms that strike the keyboard on the notebook to keep the automated set of scripts running. After the first set of scripts are completed, the notebook is allowed to go into deep sleep; after 20 minutes, the notebook is reawakened, and the scripted programs are allowed to run until the notebook's battery dies.

Weight

We weighed each notebook with a floppy drive, CD-ROM, battery and external power supply.

Notebooks that were between 7 pounds and 8 pounds received a score of excellent, between 8 pounds and 9 pounds received a very good score, between 9 pounds and 10 pounds received a good score, between 10 pounds and 11 pounds received a satisfactory score, between 11 pounds and 12 pounds received a poor score, and above 12 pounds were unacceptable. We assigned word scores, which were translated into a percentage of the 75 points awarded this category.

Setup/Ease of Use

Issues that determined this score included whether a product had bundled or preinstalled applications, disks included with the system, a ROM-based setup, flash BIOS, an on-line system tutorial and easily upgraded processor and memory. We also looked for quick-start documentation and any other features that made running the notebook easier for the first-time user. We assigned word scores, which were translated into a percentage of the 75 points awarded this category.

System Design/Expandability

To score this category, we weighted expansion features that add value to a system, such as maximum memory, maximum external cache and maximum video memory. We also weighted heavily the size of the notebook screen. Then we looked at features built into the notebook, such as sound and full or partial MPEG video support.

We looked at whether the notebook supported CD-ROM capabilities and had removable components such as hard drives, CD-ROMs and floppy drives. We also looked at externally supported features of the notebook, such as full docking capabilities and PC Card support. And last of all, we looked at and evaluated the placement of power, sleep and contrast controls, as well as other significant design advantages and flaws. We assigned word scores, which were translated into a percentage of the 130 points awarded this category.

Compatibility

To test software compatibility, we ran the BAPCO applications using a number of different video drivers supplied with the notebooks. We also looked for trouble with installed applications such as Windows. And last of all, we looked at the certified operating systems the notebooks can run. All of this combined to give a total compatibility score with a weighting of 50.

Usability Tests

Screen quality, sound quality, keyboard layout and pointing devices were judged by a panel of eight users. User scores were added to come up with a total number of points for each category. We assigned word scores that were translated into percentages of the 40 points assigned to each of the three categories. For more information on the usability tests, see From the Editor, Page 4.

Documentation

At a minimum, documentation had to tell us how to set up and use the system and had to include accurate diagrams to illustrate the text. Comprehensive, well-organized and well-written manuals received higher scores. We lowered the score if the manual was poorly organized, lacked a table of contents and index, did not include information on installing options or contained factual errors in the text. We used word scores that were translated into percentages of the 50 points assigned to this category.

Technical Support

We based technical support scores on the quality of service we received during multiple anonymous support calls and the total time we were on hold before we were able to talk to a technician. We assigned word scores that were translated into percentages of the 50 points assigned to this category.

Support Policies

A one-year warranty covering parts, labor and unlimited technical support from the vendor earned a satisfactory score. We awarded bonuses for money-back guarantees, on-site service included in the purchase price, extended support hours, bulletin board support (for example, CompuServe) and a toll-free number. We subtracted points for no technical support, a limited support period and dealer-only support. We then assigned word scores that were translated into percentages of the 75 points assigned to this category.

Price

Price was scored mathematically. The lowest-priced unit received the total possible points (150). All other systems received a percentage of the total points.

Unix Workstations

We Pick the Best Midrange System

▶ ERIC HAMMOND

Despite the explosive growth of Microsoft Corp.'s Windows NT operating system, government remains a strong market for Unix. In this issue, we review four Unix workstations in the 200 MHz processor class. All four were fast on the Standard Performance Evaluation Corp. (SPEC) CPU95 benchmark and came equipped with new, easy-to-use configuration and management tools. Read on to find which one you should buy.

Microsoft Corp.'s Windows NT operating system may be gaining ground in government sites, but many agencies remain committed to the tried-and-true Unix platform. The Defense Department, NASA and the Forest Service are just a few of the agencies investing heavily in Unix workstations and servers. These agencies need powerful, reliable, secure systems for tasks ranging from command and control to modeling rocket engines to managing geographic databases. Their preferred solution: Unix workstations.

We tested four midrange Unix workstations that range in price from $16,700 to $22,000 and are among the most popular purchases on large contracts, such as NASA's Scientific and Engineering Workstation Procurement II. We found all four systems to be fast, not too expensive and easier-than-ever to maintain. However, we also found them to be lacking in out-of-the-box support for NT, Novell Inc.'s NetWare, IBM Corp.'s OS/2 and Apple Computer Inc.'s Macintosh. Unix vendors need to recognize and work with other operating systems — especially NT — if they want Unix to be a viable long-term option.

In addition to end users, Unix systems must meet the needs of system and network administrators. Government Unix administrators fall into three categories. The "pro" is experienced but almost universally overworked. The "end user" typically is a scientist, engineer or other technical type with advanced Unix skills who is heavily involved in the administration of his own system. The "rookie" is a relative newcomer to Unix.

In evaluating these systems, we looked for no-nonsense tools to support all three types of administrators. A fancy graphical configuration tool, for example, is no good if it confuses the rookie administrator and annoys the pro. Likewise, having to disassemble a system to its component pieces to replace a dead disk drive is needless in a hot-swappable world. In addition, tools for automating administrative tasks should simplify the chore and reduce the chance for error. Finally, when all else fails, all of these folks need timely, reliable support.

You might be pleasantly surprised at how far Unix has come toward meeting these needs. The systems we tested were no more difficult to set up than a typical NT system. For the most part they included automated configuration and administration tools. In addition, the hardware was easy to service, with several systems featuring snap-in components and industry-standard PCI, EISA and ISA buses.

THE CONTENDERS

- ▶ **Hewlett-Packard Co.'s Visualize B160L Workstation,** available on SEWP II, SMP, TAC-JW and the GSA schedule. **Score: 7.00**
- ▶ **IBM Corp.'s RS/6000 43P Model 140,** available on ALMRS, Navy TAC-5 BPA, Army SBIS, SEWP II, APHIS and the GSA schedule. **Score: 7.49**
- ▶ **Silicon Graphics Inc.'s Indigo2 Solid IMPACT 10000,** available through ADAPS, IC^{4}I, NIH ECS, SASS, SEWP II, TAC-JW and the GSA schedule. **Score: 6.64**
- ▶ **Sun Microsystems Inc.'s Ultra 2 Creator3D (Model 1200),** available on SEWP II, AFWS, Navsea CAD-2, Navair CAD-2, Navfac CAD-2, TAC-JW, IC^{4}I, SASS, I-CASE, FAA STARS, CHS II, TDPI and the GSA schedule. **Score: 8.03**

We tested Hewlett-Packard Co.'s Visualize B160L Workstation, IBM Corp.'s RS/6000 43P Model 140, Silicon Graphics Inc.'s Indigo2 Solid IMPACT 10000 and Sun Microsystems Inc.'s Ultra 2 Creator3D (Model 1200). (Digital Equipment Corp., the other major Unix workstation vendor, was unable to supply us with a machine to test.) All the systems are in the 200 MHz range. They generally are single-processor machines, with the exception of Sun's Ultra 2, which can be expanded with a second CPU. Given that many Unix users need high-end graphics performance, we requested machines with high-performance 3-D graphics. This generally added several thousand dollars to the price of each system. If you don't require the graphics power, these systems can be had for a lot less money. The systems had 2G to 4G of hard disk, and we asked for a CD-ROM as well as a Digital Audio Tape (DAT) drive.

Our winner was Sun's Ultra 2 Creator3D. It isn't the price leader but offers a lot of bang for the buck. The Ultra 2 is fast, expandable and easy to work with. It has a powerful and intuitive configuration tool and, with Wabi, goes the farthest of any of the systems in reaching out to other operating systems.

Sun Ultra 2 Creator3D

The Sun model that we tested included a 200 MHz SuperSPARC CPU, 128M of RAM, 2.2G of disk space, an 8mm tape drive and a CD-ROM. It had the Sun Creator3D graphics adapter and a 20-inch monitor. This configuration sells for $20,413 on SEWP II.

This system was the pleasant surprise of the comparison. While Sun doesn't ship systems pre-configured (unless you pay for it), the company has a simple yet powerful configuration utility that makes installing the OS worth the time. After booting from the Solaris CD (which you have to order separately), the utility walks you through the basics of configuring the system. Rookie administrators will like the informative text and default selections in the process, while experienced administrators will like the flexibility offered by the Transmission Control Protocol/Internet Protocol and disk layout sections of the installation.

The Ultra 2's case is slightly bulkier than that of the rest of the units in the comparison, but when you pop the top, you can work on any component without hav-

AT A GLANCE

Unix Workstations

Pricing

This class of workstation runs from $16,700 to $22,000, depending on the configuration.

What's Selling

Many government users remain convinced that Unix workstations provide the most reliable, stable and secure platform for mission-critical processing.

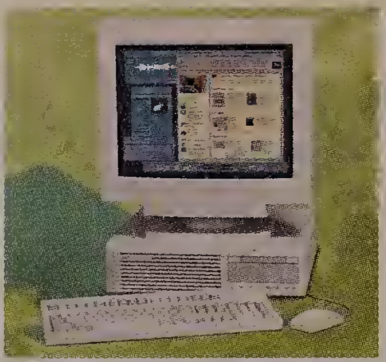
Where to Find Bargains

Pricing and support options will vary from contract to contract. Do your homework.

What to Specify

With experienced Unix system administrators at a premium, plug-and-play functionality, on-line help and easy-to-use installation and configuration tools are essential.

Unix Workstations Compared



	WEIGHTING	**HP Visualize B160L Workstation**	**RS/6000 43P Model 140**	**Indigo2 Solid IMPACT 10000**	**Ultra 2 Creator3D (Model 1200)**
Company		**Hewlett-Packard Co.** **(800) 637-7740** **www.hp.com**	**IBM Corp.** **(800) 333-6705** **www.ibm.com**	**Silicon Graphics Inc.** **(800) 800-7441** **www.sgi.com**	**Sun Microsystems Inc.** **(800) 821-4643** **www.sun.com**
Tested Configuration (See individual write-ups for more details.)		200 MHz PA7300 PA RISC processor, 368M of RAM, 2G hard drive, 4mm DAT drive, HP Visualize 3-D graphics adapter, 20-inch monitor	200 MHz PowerPC 604e processor, 128M of RAM, two 2.2G hard drives, 4mm DAT drive, IBM GXT800P graphics adapter, 20-inch monitor	200 MHz MIPS R10000 processor, 128M of RAM, 2G hard drive, 4mm DAT drive, SGI Solid IMPACT graphics adapter, 20-inch monitor	200 MHz SuperSPARC processor, 128M of RAM, 2.2G hard drive, 8mm tape drive, Sun Creator3D graphics adapter, 20-inch monitor
SPECint95*	75	7.75 **65.46**	7.22 **60.98**	8.88 **75.00**	7.72 **65.20**
SPECfp95*	75	7.56 **49.74**	5.23 **34.41**	10.60 **69.74**	11.40 **75.00**
System Design/Expandability	175	★★☆ **105.00** The small case was great, but there are trade-offs. The external drive bay cannot be used if you have two disk drives installed. Only two expansion slots — one for EISA, PCI or HP GSC card and one for PCI and HP GSC cards — also limits the HP. Our unit included 384M of RAM, an optional fast-wide SCSI-2 controller and 24-bit accelerated 3-D graphics via the HP Visualize 24 graphics adapter.	★★★ **140.00** Enough room inside and on the front of the machine means that the tape and CD-ROM drives could be internally mounted. Working inside the case is a tight squeeze. Configuring any new peripherals is easy with SMIT. The system includes a tablet port. Our system featured the IBM GXT800P double-buffered 24-bit 3-D graphics adapter.	★★☆ **105.00** The system has a limited number of drive bays. Adding SCSI devices is easy with the front-accessible snap-in bays. The system includes strong support for audio in and out. It will support up to 2G of RAM with 128M SIMMs. The case was difficult to open and close.	★★★★ **175.00** The case is the most flexible of any we tested. A separate video bus improves video performance and leaves SBus slots free for other peripherals. Working under the hood is a joy.
Setup/Ease of Use	125	★★☆ **75.00** The HP's slim case is easier to sling around during setup than other bulkier systems. Pre-configuration of hardware and software on the system is a pricey option. The HP configuration tool is fairly thorough and intuitive, but confusion sets in if you want to skip a step in the network configuration. OS media and documentation have to be ordered separately.	★★★ **100.00** IBM ships the system with hardware pre-configured and the OS installed. If you ask the company, it will ship the system unconfigured. The browser-based configuration ran as "guest" rather than "root." A quick-start guide was provided. Diagnostic utilities are included with the system. OS media and documentation have to be ordered from IBM.	★★★ **100.00** The configuration utility covered the basics. The snap-in drive bays on the front are quite nice, especially compared with the digging that has to be done to remove a drive from the IBM system. The quick-start guide was helpful and clear. The SGI Indigo2 is the only tested machine that ships with the OS media and documentation in the box.	★★☆ **75.00** The OS is not loaded at the factory, nor are optional peripherals. The system did not include setup manuals or a quick-start guide. However, Sun has the most well-thought-out configuration tool.
Compatibility	125	★★☆ **75.00** Little or no built-in support for other NOSes or OSes. Third party applications can be purchased and configured to run other OSes. The system will read and write DOS floppies.	★★☆ **75.00** Like most systems, the IBM was weak out of the box in this area. It has minimal built-in support for NetWare. Optional software is required to get any kind of serious support for other OSes.	★★☆ **75.00** Once again, not a strong point of out-of-the-box Unix systems. Optional tools are available to connect to NetWare, NT and Macintosh.	★★★ **100.00** Sun also does little out of the box to support other systems. But it includes Wabi, which provides a Windows emulator. Support for NetWare, Windows NT and Apple networking costs extra.
Documentation	75	★★★ **60.00** HP's documentation is concise and informative. It is clearly laid out and easy to read. The on-line documentation was helpful, especially the help screens in the System Administration Manager.	★★☆ **45.00** The documentation is thorough but a little cluttered and hard to follow. InfoExplorer offers on-line help with a simple-to-navigate GUI, although the information is not well-organized.	★★★ **60.00** System manuals are clear and concise. Ample on-line documentation is provided.	★★ **30.00** Sun's documentation is adequate, but no quick-start guide or hardware manual are provided. Answerbook offers good on-line documentation, and if you buy the media kit, it has excellent software documentation.
Technical Support	100	★★ **40.00** On our first call to HP, the technician was unfamiliar with setting the monitor resolution, but he was able to get help for us. HP refused to answer our second call until we paid them $1,250 because they said our system was no longer under a support contract. We defaulted the score to satisfactory.	★★★★ **100.00** IBM's support staff quickly routed us to a technician who was able to solve our problems. Our question about the man pages was quickly answered. Our second call was about NIS problems, and the technician was more than helpful, offering numerous suggestions for solving the problem.	★★ **40.00** We made one call to SGI that was not returned. The company claimed that our system did not exist and did nothing to figure out why. It later faxed a note asking for a minimum of $500 to handle the call. As a result, we defaulted the score to satisfactory.	★★★ **80.00** Sun's support was timely and accurate. Our first question about setting up CDE was quickly answered. Our second question about NIS was answered, and the technician e-mailed us a comprehensive guide to configuring and trouble-shooting NIS.
Support Policies	100	★★★ **80.00**	★★★ **80.00**	★ **20.00**	★★★ **80.00**
Warranty		1 year	1 year	90 days	1 year
On-Site Service		Fee-based	1 year	Fee-based	Fee-based
Money-Back Guarantee		None	None	None	None
Fax-Back Support		No	Yes	No	Yes
Toll-Free Line		Yes (with a service contract)	Yes	Yes	Yes
Other Support		Internet	Internet	Internet	Internet
Support Hours		24 hours, 7 days	8 a.m. — 8 p.m. M-F	8 a.m. — 5 p.m. M-F	8 a.m. — 5 p.m. M-F
Government Price (as of March 21)	150	$16,705 **150.00**	$21,991 (Includes AIX software) **113.94**	$21,004 **119.30**	$20,413 **122.75**
Reseller/Prime		HP	FDC Technologies	Silicon Graphics	Sun Microsystems
GSA No./Contract		GS-35F-0002D	GS-035F-0171D	GS-35F-0135D	SEWP II
Phone		(800) 468-8347	(800) 787-4040	(800) 800-7441	(800) 247-8111
Final Score	1000	**7.00**	**7.49**	**6.64**	**8.03**
Remarks		**The HP is a good, compact system. It is a strong performer for the money and comes with excellent documentation and system administration tools.**	**The IBM system is the most expensive in the comparison, and it has the slowest benchmark performance. However, the RS/6000 is well-engineered with a case that will fit a variety of peripherals.**	**SGI had the highest integer performance scores, and it is easy to add devices to the system. However, the company's support scores dragged the final score down. We'd like to see SGI offer better support for this system.**	**The Sun Ultra 2 Creator 3D was the clear winner. This system has outstanding floating-point performance, and it is the only machine in the comparison that can be upgraded with a second processor.**

Products receive ratings from excellent to unacceptable in certain categories. Scores are derived by multiplying the weighting of each criterion by its rating, where:

★★★★	= Excellent = 1.0	Outstanding in all areas
★★★	= Very Good = 0.8	Meets all essential criteria and offers significant advantages
★★☆	= Good = 0.6	Meets essential criteria and includes some special features
★★	= Satisfactory = 0.4	Meets essential criteria
★	= Poor = 0.2	Falls short in essential areas
●	= Unacceptable = 0.0	Fails to meet minimum standards or lacks a feature

Scores are summed, divided by 100 and rounded down to two decimal places to yield the final score out of a maximum score of 10.0 (plus bonus). Products rated within 0.2 points of one another differ little.

*Published SPEC scores.

ing to remove or twist your way around any other component. The layout is pure genius. The disk drives sit under the CD-ROM and floppy drives but snap out the side of the case. The memory is under a curved door that also holds it in place. The CPU slots are side by side, and the CPU modules snap in and out easily.

A separate video bus, built-in SCSI-2 and built-in 100Base-T Ethernet leave the four Sbus slots open for bigger and better things. Too bad there isn't a little more room for an external bay to hold a tape drive. We also wish the Sun system had better built-in administration tools; Admintool just doesn't get the job done. It would be nice to have a tool that made disk administration easier and allowed for changing network configurations without unconfiguring the system.

While none of the vendors provide compilers, Sun makes it fairly easy to get a 30-day trial license for its compilers, after which you must purchase them to continue using them. However, 30 days provides you with ample time to procure the free Gnu gcc C compiler available on the Internet.

The Ultra 2 is a speedy machine. Its SPECfp95 number, 11.40, blew away the competition, and 7.72 for SPECint95 put it on par with the other machines.

The Sun Ultra 2 was the clear winner in the comparison. It offers snappy performance that can be upgraded with a second CPU, and Sun's support staff was willing to go the extra mile. If you want a top-notch Unix machine for a variety of computing tasks, from database management to geographic information systems, the Sun Ultra 2 is a sure bet.

IBM RS/6000 43P Model 140

This IBM model featured a 200 MHz PowerPC 604e processor, 128M of RAM, two 2.2G disks, a 4mm DAT drive, an 8X CD-ROM, a floppy drive, an IBM GXT800P graphics adapter, an additional 100Base-T Ethernet interface and a 20-inch monitor. This configuration sells for $21,991 on the GSA schedule.

The IBM was the only system in this comparison that fit all of these components inside the case and still had room for more. However, the case is relatively compact, which means that working under the hood is tricky. With room for two internal drives in addition to a floppy drive, DAT drive and CD-ROM, the IBM unit offers flexibility and expansion. In addition, with five expansion slots, the 43P still had room for three more cards after the video board and Fast Ethernet interfaces were installed.

The first-time configuration was a bit disappointing. We were initially impressed by the browser-based configuration of the date, time, TCP/IP basics and root password. Then we realized that it was all running as "guest," and these settings couldn't be modified at all. We had to exit the browser, continue with the boot process, log in to CDE as "root" and restart the browser with the configuration utility in it. After we configured the system, it launched the browser at every boot up until we figured out how to turn it off.

The IBM system's best feature is the System Management Interface Tool (SMIT). It is the model by which all other system administration tools were judged. Although its dual text- and GUI-based interface is a bit clunky at times, it's worth it to be able to run the full suite from a vt100 terminal. Pro and end-user administrators will value the extent of SMIT's functionality, while rookies will value the fact that SMIT simply runs shell scripts and shows those scripts at any time, making it a valuable learning tool.

Another nice feature on IBM's AIX OS is the logical volume manager. It makes the tricky, time-consuming task of administering Unix disks a snap, once you understand how it works.

The IBM was the slowest machine in the comparison, turning in a SPECfp95 number of 5.23 and a SPECint95 number of 7.22. While these numbers are adequate for most applications, if you're one of those users who needs speed, this machine might not be for you.

At almost $22,000, the IBM was near the top, price-wise. For the money, you get a system that's built like a tank, has a compact footprint with a lot of expansion and boasts one of better Unix variants on the market today in AIX. IBM's support is top-notch, and the system includes full-featured administrative tools and diagnostics. If the price were a few dollars lower and the SPEC numbers a little higher, this system would be a contender. If you're in a shop with an installed IBM base or if you want a good all-around system and aren't as concerned with price, you won't be sorry you bought an IBM.

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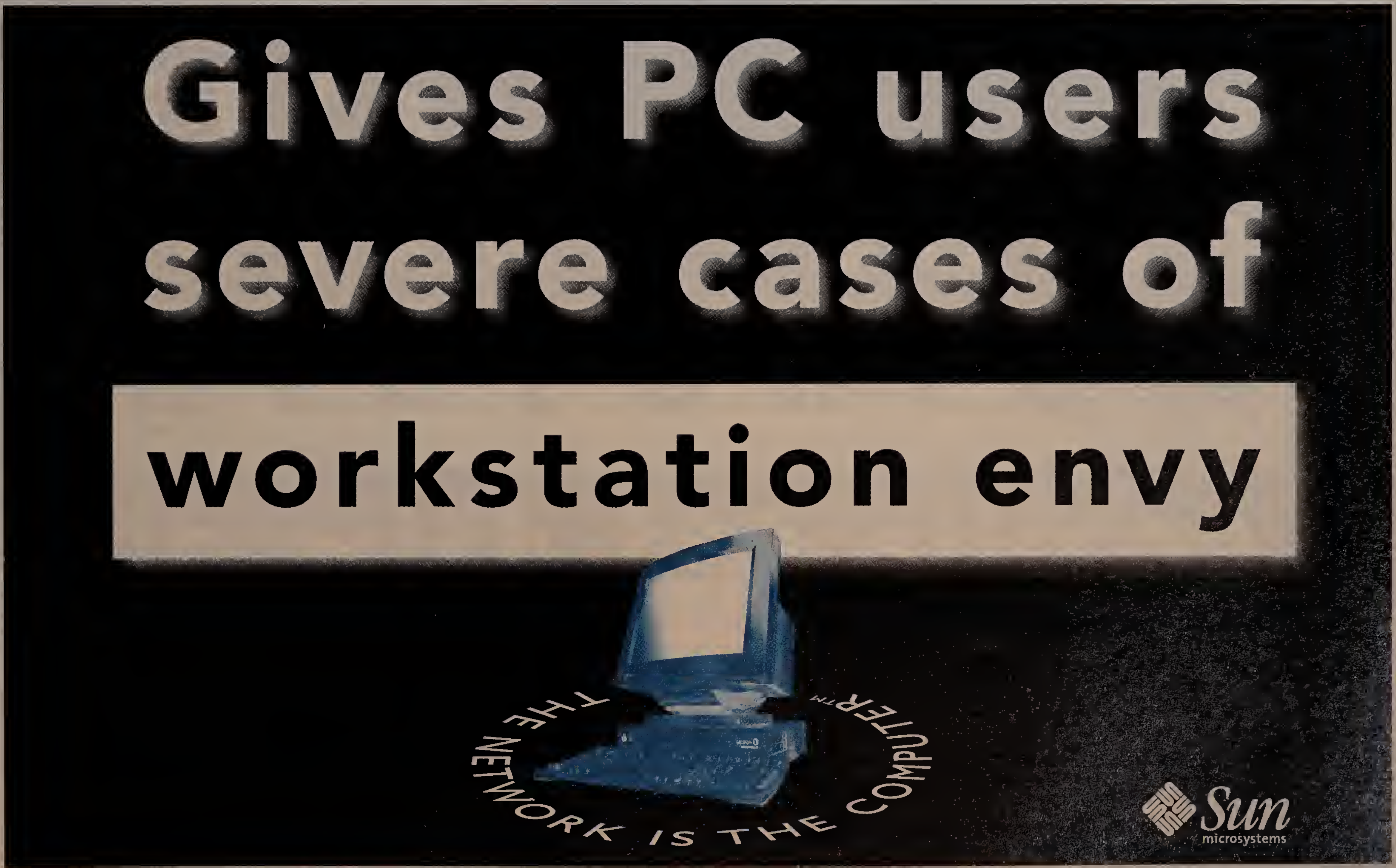
HP Visualize B160L Workstation

The HP system we tested included a 200 MHz PA7300 PA reduced instruction-set computing processor, 368M of RAM, 2G of disk space, a 4mm DAT drive, an HP Visualize 3-D graphics adapter and a 20-inch monitor. HP did not include a CD-ROM with our unit; however, we have priced the system with a CD-ROM drive. This configuration sells for $16,705 on the GSA schedule.

We liked the B160L's compact design until we realized the trade-offs that were made inside the case. It had room for only two internal SCSI devices and a floppy drive. We prefer systems that can support at least a couple of disk drives internally and still have room for a floppy drive, DAT drive and CD-ROM on the front. The only machine with that level of expandability was IBM's 43P.

The HP is a very clean system. As it boots, it displays in plain lan-


Gives PC users severe cases of
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Sun microsystems

guage a list of the steps in the boot process. It then runs down the list and marks each step as O.K., N/A or FAIL. This makes it easier to trouble-shoot boot-up problems than the strings of cryptic messages that go scrolling by on many systems. However, we noticed that after the NIS step failed, NIS errors started scrolling over the remaining steps in the boot process. HP includes a simple utility that runs at the first boot to configure the host name, TCP/IP information and root password. It isn't as in-depth as Sun's configuration utility but covers the basics.

We particularly liked HP's System Administration Manager (SAM), which provides a GUI-based tool for performing administrative tasks. It is intuitive to use for tasks such as configuring Network File System (NFS) and straightforward enough for tuning a kernel parameter that was needed for SPEC to run properly. SAM includes context-sensitive help that meets the needs of the rookie administrator without getting on the nerves of the pro.

HP's Logical Volume Manager, a tool that simplifies Unix disk administration, is a costly option. Given the power and flexibility that LVM offers, as well as the fact that a similar tool is standard on the IBM unit, we think HP should include LVM on every system it ships.

The HP's performance was in the middle of the pack. With a SPECint95 number of 7.75 and a SPECfp95 number of 7.56, the HP is competitive with the fastest machines in this test, and its SPECfp95 score leaves the IBM 43P in the dust.

The HP wasn't the most expandable system in the comparison, but it was the least expensive. If you need decent performance in a small footprint and don't care too much about expandability, the HP Visualize B160L is a solid performer for the dollar and is easy on the administrator as well.

SGI Indigo2 Solid IMPACT 10000

The Silicon Graphics unit we tested had a 200 MHz MIPS R10000 CPU, 128M of RAM, 2G of disk space, a 4mm DAT drive and a CD-ROM. The system included an SGI Solid IMPACT graphics adapter and a 20-inch monitor. It sells for $21,004 on the GSA schedule.

SGI, as usual, provided the most interesting-looking machine in the comparison. In this case, however, the company's focus on good looks may have gotten in the way of practical functionality. We found ourselves in a bit of a purple haze trying to get at the CD-ROM and tape drives through the little plastic doors on the front. And when we removed the case, a purple rain of plastic shavings fell into the machine.

This cosmetic overkill, however, shouldn't diminish the SGI system's most pleasant surprise. The front panel storage bays (the only ones in the system) are all fitted with snap-in trays. You can swap out a hard drive or add a CD-ROM or tape drive without opening the case. Of course, someone could steal one of these components with very little effort too, so a little purple lock on the front panel would be a welcome addition.

We expected more from SGI in the way of GUI-based tools for configuring the system. The network configuration was a bit flaky and refused to mount a CD-ROM file system that was exported via NFS from the IBM system. The other machines had no trouble with it. Additionally, at times it

Oh, my.

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seemed like the network configuration didn't want to take hold. Also, at one point in the process, the system queries NIS and gives a confusing warning about duplicate IP addresses if it finds an entry for itself. On the plus side, the administration tools are fairly intuitive to work with, and the online documentation is informative and effective.

The SGI is a solid performer. Its MIPS R10000 CPU produces a SPECfp95 number of 10.60 and a SPECint95 number of 8.88. These results were No. 2 and No. 1 in the comparison, respectively.

Support aside, the SGI Indigo2 is an impressive machine. Given SGI's strength in multimedia and its benchmark performance, this is the machine for you if you're doing graphics- and video-oriented work. It is also a solid performer for folks who just need raw computing power. ◀

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NOTES FROM THE TEST CENTER

SPECtacle

Do Benchmarks Compare Apples to Apples?

▶ ERIC HAMMOND

The Standard Performance Evaluation Corp. (SPEC) CPU95 benchmark that we used in this comparison is designed to measure floating-point and integer performance of a CPU, memory architecture and compiler.

Improvements relative to the older SPEC benchmark, CPU92, include longer run times, larger data sets so that all of the operations are not performed in cache, and more realistic applications based on real-world computational problems.

SPEC CPU95 numbers indicate a system's performance relative to a Sun Microsystems Inc. SPARCstation 10/40. Higher numbers are better. A system's SPECfp95 number indicates floating-point performance, and a system's SPECint95 number indicates integer performance.

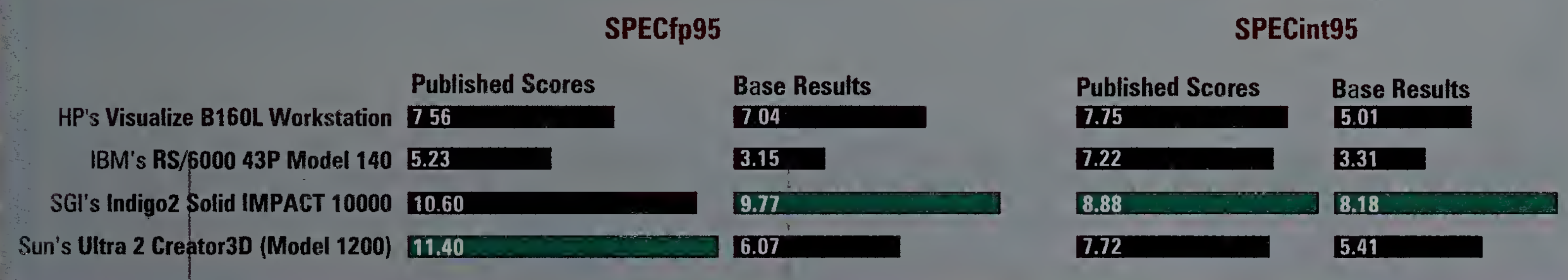
The SPEC code must be compiled on a test system before it can be run. Because compilers can be optimized through the use of compiler flags, it is important to understand the effect of these flags on the final SPEC numbers. If a user does not optimize the compiler each time he compiles code, the SPEC numbers based on a highly optimized compilation would not be an accurate measure of the performance that user could expect. Likewise, a user who highly optimizes compilation would achieve better performance than SPEC numbers based on an unoptimized compilation.

Taking this into consideration, SPEC devised rules for running the benchmark. These rules state that a published SPEC result must include a "base" run with relatively minor optimization. Additionally, rules for "peak" optimization limit the tweaking that can occur on the high end.

We ran "base" SPEC benchmarks on all the machines. Our thinking was that many users would probably not spend a lot of time optimizing compiler performance. They then could expect performance somewhere between our numbers and the manufacturer's published SPEC numbers for the system. To give you an idea of the importance of optimization and the variety of SPEC results that can occur as a result of varying compiler optimizations, we included our SPEC base results in the chart below.

However, to be sure we provided an apples-to-apples comparison, we scored the systems based on the published SPEC numbers. While these numbers may be higher than your actual performance, we feel that they represent a good measure of each system relative to the other systems in the comparison.

SPEC Performance Scores (Published Scores and Base Results — Higher Scores Are Better)



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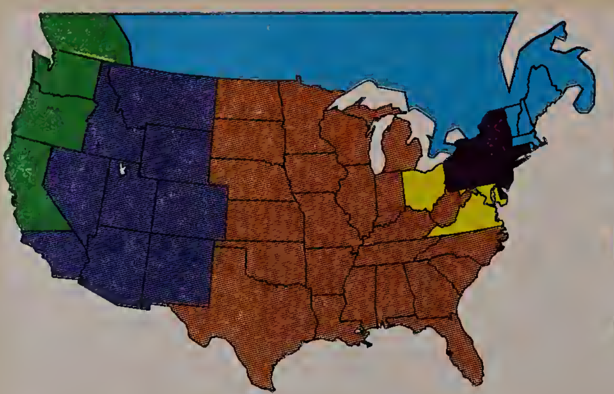

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HOW WE TESTED

Unix Workstations

We evaluated four midrange Unix workstations by looking at their ease of setup and administration, design and performance on the Standard Performance Evaluation Corp. (SPEC) CPU95 benchmark. SPEC is a nonprofit corporation comprising more than 40 companies. SPEC is determined to provide useful, fair metrics for measuring system performance.

SPEC CPU95 Benchmark Performance

This was a purely mathematical score with a maximum of 150 points. The system with the highest SPECint numbers received 75 points. The other systems received a percentage of 75 points based on their performance relative to the winner. The system with the highest SPECfp numbers received 75 points as well, with the other systems receiving a percentage of the 75 points. SPECint is a measure of integer math performance. SPECfp is a measure of floating-point performance. The SPEC CPU95 benchmark therefore measures the number-crunching power of a system for applications such as geographic information systems, scientific computing and computer-aided design. It does not measure system throughput for applications such as relational databases, which also are dependent on disk performance.

System Design/Expandability

Again keeping in mind Unix administrators' aversion to spending lots of time on what should be simple tasks, we looked at how easy it is to add hardware to the systems. Systems scored points for easy access and plentiful ports.

We preferred systems with room for lots of disks and multiple SCSI buses as well as the ability to support symmetrical multiprocessing. We used word scores that were translated into percentages of the 175 points assigned to this category.

Setup/Ease of Use

Keeping in mind the time constraints placed on the average Unix administrator, as well as the wide variety of experience that administrators have, we looked at how quickly and easily the systems could be set up and configured.

Systems scored well if they included helpful documentation for less experienced administrators and configuration tools that worked well for new and old administrators alike. We took away points for "clever" configuration software that in reality made the process more complicated. We used word scores that were translated into percentages of the 125 points assigned to this category.

Compatibility

We looked at the systems' compatibility with other operating systems and network operating systems. A system that came out of the box with support for Novell Inc.'s NetWare, Apple Computer Inc.'s Macintosh, IBM Corp.'s OS/2 and Microsoft Corp.'s Windows NT received an excellent score. Optional support for these operating systems scored fewer points. Inclusion of Network File System scored points too.

As a last resort, we expected the system to at least read a DOS floppy. We didn't count support for Transmission Control Protocol/Internet Protocol as support for other OSes. We used word scores that were translated into percentages of the 125 points assigned to this category.

Documentation

We looked at the quantity and quality of the documentation. On-line documentation was considered, though it had to go beyond the Unix "man" command. At a minimum, printed documentation had to tell us how to set up the system and get to the on-line documents. We used word scores that were translated into percentages of the 75 points assigned to this category.

Technical Support

We based technical support scores on the quality of service we received during multiple anonymous support calls. If we could not do an anonymous call, we defaulted the score to satisfactory. We assigned word scores that were translated into percentages of the 100 points assigned to this category.

Support Policies

Scores in this category were based on the vendors' responses to a survey. A one-year warranty covering parts, labor and unlimited technical support from the vendor earned a satisfactory score. We awarded bonus points for unconditional money-back guarantees, on-site service included in the purchase price, extended support hours, bulletin board support (such as CompuServe) and a toll-free number. High standards for Unix support? Maybe, but that's what it will take for Unix to be viable in an NT world. We used word scores that were translated into percentages of the 100 points assigned to this category.

Government Price

Price was scored mathematically. The lowest-priced unit received the total possible points (150). All other systems received a percentage of the total points.

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SmartSuite 97

New Version Supports Collaborative Computing Over the Web

▶ JEFFREY GORDON ANGUS

The biggest news in the new version of SmartSuite is Internet capabilities, which have been integrated into all the office applications. SmartSuite 97 also keeps its lead in groupware and remains the low-priced offering in this category.

When we evaluated office suites last year, Lotus Development Corp.'s SmartSuite 96 edged out Microsoft Corp.'s Office 95 as the best value by the barest margin. Both companies have upgraded their products since then, but the new versions offer the same competitive strengths as the predecessors [see Office 97 review, Jan. 6].

We gave the Lotus package higher scores for groupware, collaborative strengths and price. While hundreds of features have been added to SmartSuite 97, the most valuable are in the extension of groupware and collaboration over new media — most notably, the Internet.

The individual applications have been cleverly integrated with the Internet, while the automation language, LotusScript, has extensions to interact with the Internet. Among the new features are hot links within documents to Uniform Resource Locators (URLs) and a "Save As HTML or to an FTP Server" command throughout. More importantly, the document review and consolidation features that made SmartSuite so attractive for collaborative users now work with the Net as well.

The downside of all this is a large requirement for disk space and computer muscle. While you could make this run on a 66 MHz 486, we recommend nothing less than a 90 MHz Pentium with at least 16M of RAM for a user running multiple applications and using the SmartCenter, Lotus' control console for the suite.

Another major change with SmartSuite 97 is that SmartCenter has been redesigned. The 97 SmartCenter uses a drawer-and-folder metaphor with access to suite (and other) programs, documents and Internet-connected on-line help and sites. It's clever, straightforward and usable. But for high-end users, it may add less value than Microsoft's new hub, the Outlook utility.

Overall, SmartSuite 97 provides agencies with more functionality, and integration is better than ever. If you liked the previous version, you'll appreciate the latest version — if you've got the computer power to run it. And if your agency is accentuating team computing or Internet integration with your network, there's no better office suite.

Installation/Configuration

The SmartSuite 97 installation is very flexible, although a mite con-

REVIEW: SMARTSUITE 97

	WEIGHTING	**SmartSuite 97**	
Company		**Lotus Development Corp.** **(800) 346-1347** **www.lotusgov.com**	
Installation/Configuration	100	★★★ You can install at a desktop machine. You can install from a server or in an unattended process by mailing a script. Users can run from a CD-ROM to trim disk space requirements, though at the cost of speed.	80.00
Application Components	100	★★★ The Lotus suite includes a spreadsheet, word processor, presentation graphics and database, and it extends smoothly to the Internet and Notes.	80.00
Operations/Interface	150	★★★ For beginning and intermediate users, the SmartCenter hub is extremely useful, and IS or power-users can customize it and individual programs. Bundled templates and style sheets are outstanding. Ease of use is good, but the abundance of features begs training.	120.00
Groupware	150	★★★ The presence of consolidation and review utilities, the intense linking to e-mail clients and the integration with intranets, the Internet and the Web all make SmartSuite the most accessible collaborative environment that's widely available.	120.00
Integration/Automation	150	★★★ LotusScript works across the major programs. Its development environment is more of a developer's tool than a power user's. SmartCenter is a good tool for beginning users.	120.00
Documentation	75	★★☆ On-line help is more than adequate, well-organized and well-written. The one manual in the package is task-oriented and very usable.	45.00
Technical Support	75	★★☆ Surprisingly for a new product, our hold times were under 5 minutes. Staff was unevenly informed about advanced topics but worked very hard and found the right answer.	45.00
Support Policies	75	★★★	60.00
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Phone Support		60 days free. Paid options.	
Other Support		CompuServe, Internet, fax-back, Lotus Knowledge Base	
Support Hours		8 a.m. — 8 p.m. M-F (EST)	
Price	125	★★★★	125.00
GSA Price (as of March 21)		$372	
Upgrade Price		$137	
Reseller		ASAP Software Express	
GSA No.		GS-35F-4027D	
Phone		(800) 248-ASAP	
Final Score	1000		**7.95**
Remarks		**SmartSuite 97 is a powerful collaborative office suite, extending network strengths to the Internet. The drawbacks are size and speed, which make high-performance equipment a must. The 32-bit 1-2-3 alone will capture some users.**	

Products receive ratings from excellent to unacceptable in certain categories. Scores are derived by multiplying the weighting of each criterion by its rating, where:

★★★★ = Excellent = 1.0 Outstanding in all areas
★★★ = Very Good = 0.8 Meets all essential criteria and offers significant advantages
★★☆ = Good = 0.6 Meets essential criteria and includes some special features
★★ = Satisfactory = 0.4 Meets essential criteria
★ = Poor = 0.2 Falls short in essential areas
● = Unacceptable = 0.0 Fails to meet minimum standards or lacks a feature

Scores are summed, divided by 100 and rounded down to two decimal places to yield the final score out of a maximum score of 10.0 (plus bonus). Products rated within 0.2 points of one another differ little.

ATTENTION SHOPPERS

Where to Buy SmartSuite 97

SmartSuite 97 is available on the GSA schedule from ASAP Software. The license-only version sells for $104, and the shrink-wrapped version sells for $373. An upgrade copy costs $137. The enhanced suite will be added to several contracts, including: the Air Force's Non-Appropriated Funds contract; the Army's LCU, PC-2 and Portable-2 pacts; the Defense Department's PC LAN+ and Integrated Command, Control, Communications, Computers and Intelligence contracts; the Justice Department's Justice Laptop; the National Institutes of Health's Electronic Computer Store contract; the Treasury Department's Treasury Department Acquisition-1 and TDA-2 pacts; and the Department of Veterans Affairs' Procurement of Computer Hardware and Software contract.

fusing. It opens with a panel to select the applications you're planning to install. The next panel lets you drill down and choose the components you want. These two could have been combined.

You can install on an individual machine or over a network from a single machine. You can also run an unattended network installation procedure by sending an icon to users and having them execute it at their convenience. Overall, we rated installation very good.

Application Components

The biggest difference in SmartSuite 97's applications is 1-2-3, which is now a 32-bit implementation. Other major components include WordPro for word processing, the Approach database and Freelance Graphics presentation software. The suite also includes Organizer, a planner, and ScreenCam, an authoring tool for creating multimedia on-line help or tutorials.

You can summarize the enhancements in this version in one word: Internet. While Lotus' suite has always been the best for collaboration over a network, those features now work over intranet or Internet connections too. WordPro reads and creates HTML pages using bundled style sheets. Approach, like Microsoft's Access, automates the reading and writing of data to files using the Internet as a connection medium, as does 1-2-3. Freelance Graphics makes presenting over the Internet quite easy.

The addition of a 32-bit 1-2-3 and practical Internet functions bring this score to very good.

Visit our Web site at **www.fcw.com/pubs/gbb**, where a hotlink to the vendor mentioned here is available for your convenience.

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Operations/Interface

SmartSuite 97 still has the SmartCenter as its working hub, but it's the same in name only.

Before, SmartCenter was a floating button bar that didn't do much but offered quick program launching. The 97 version is a flexible, customizable command center built around a file-drawer-and-folder metaphor. While it's very usable, it assumes that every user with an Internet connection runs that connection all the time. SmartCenter's default is to run at start-up, and it tries to launch your default Internet connection as part of its launch sequence.

With SmartCenter you can launch applications, documents or URLs and organize your work in folders by project or by application. Because you can include everything — not just Lotus programs or resulting files — many users may choose to use SmartCenter as their everyday operations console instead of Windows 95's Start menu. It's good for beginners, but high-end users may prefer Microsoft's Outlook.

Lotus has continued the trend toward uniform buttons between applications, which makes moving among programs easier for users. The company has done a good job here and, as always, makes it easy for an administrator or end user to customize which buttons appear and in what order.

Lotus programs use what they call the Info Box for formatting and other specifics. This tabbed, stay-on-top dialog box provides a dense set of controls for formatting. It's a blessing in one sense (providing everything you need to find for formatting in one condensed spot) and a curse in another sense (in that the sheer number of possibilities intimidates some users).

SmartMasters are preprogrammed and formatted documents that you can customize for your organization. Lotus provides these in all the major applications, and while many are extraneous, some are great. These include creating a home page in WordPro, canned presentations with multiple page types in Freelance Graphics, an electronic expense report form in 1-2-3 or a Web-connected database application in Approach. SmartSuite 97 is the leader in providing templates that save you time and teach you how to create documents.

One new feature in 1-2-3 is particularly useful: a dynamic print preview, a boon to anyone who has ever tried to tweak a spreadsheet to get pages to break in certain spots. The preview window isn't that snappy, but it's still considerably faster than competitors' models, which force you to interactively tweak and then view a print preview.

While Lotus' on-line help is not as innovative as the help in Office 97, it is very good in its own traditional way. The multimedia tours aren't useful for any user beyond the completely raw, but the on-line help topics are clear and well-organized.

The superior SmartCenter and the relative clarity of the Internet integration earn SmartSuite 97 a score of very good for its interface.

Groupware

SmartSuite 97 includes all the state-of-the-art ideas in collaborative computing. This has historically been Lotus' strength, and that lead is cemented with SmartSuite 97's intranet/Internet extensions and improved integration with Lotus Notes.

The two applications most likely to need versioning have it: WordPro and 1-2-3. In Lotus' scheme, a versioned document has every changed version annotated and saved in a compact (changes-only) format. This saves disk space — but costs a bit of time at opening — and promotes archives that can be audited. The controls for doing this are in "Version Manager," a relatively easy-to-use mechanism. We'd like to see this feature extended to Freelance Graphics.

The suite has team-oriented mailing features in all major applications. You can route a message either as a broadcast or to individuals and get automatic notification when it advances from one user to the next on its route.

The TeamReview feature is a flexible mechanism for distributing documents by e-mail, Notes or floppy, with annotations and instructions for comment by others. While the feature set here is just right, we think many users will require some training in it before use.

New groupware features include open and save to the Internet and to Notes databases. The ability to use Approach's friendly interface as a front end to the capable but funky Notes is a big advantage.

Also new is TeamConsolidate, a feature that brings together the comments of multiple reviewers of 1-2-3 or WordPro files. Typically, people choose either serial or parallel reviews, but automating it this way gives all the benefits of parallel with some of the benefits of serial reviews. By consolidating the comments in one file, the process of incorporating changes becomes easier.

The group calendaring feature is not as strong as it could be. Perhaps the thought that people were using Notes or a Notes add-in limited Lotus' effort in this area. Organizer's groupware features exist but are rudimentary relative to the functions offered in the rest of the suite, although they are extended to the Web.

With the deepest and best-thought-out groupware features of any suite, SmartSuite 97 earns a very good score in this area.

Integration/Automation

All SmartSuite 97's major applications support OLE 2 as both client and server programs. New is Organizer's ability to act as an OLE 2 client. Given the heftiness of today's suites, however, we don't recommend OLE 2/ActiveX as an integration mechanism for users with anything less than the most modern, high-performance equipment.

For beginners, using either SmartCenter or created Web pages as a device to integrate various applications' products is fairly easy and intuitive.

The macro ability, especially in 1-2-3 and in WordPro, is very robust. The existing 1-2-3 macro set worked as expected.

The automation language, LotusScript, works across the suite's major programs and now supports 1-2-3. The development environment has the expected components: editor, object browser and debugger.

The on-line documentation is quite good, and a printed equivalent is available. In spite of all the attempted hand-holding, this facility is only for use by object-oriented programming initiates. We haven't seen a good third-party book for LotusScript, but it would benefit from one.

The addition of a better beginner's integration mechanism in SmartCenter and the extension of LotusScript to support 1-2-3 give this product a very good score.

Summary

SmartSuite 97 is an admirable — if large — suite with unmatched strengths in collaborative computing and integration with the Internet and Notes. ◀

Angus is a free-lance writer based in Seattle, Wash.

HOW WE TESTED

SmartSuite 97

We tested SmartSuite 97 on a Hewlett-Packard Co. Vectra 486/66N. We installed the full product to the hard drive, removed it and then tested the custom installation.

We rated and scored the application components in each product. We performed general operations in each product, such as creating new files in each application and sharing data across applications. We also exercised the workgroup features of each application. We analyzed how parallel the user interface is among component applications.

In the area of integration/automation, we evaluated support for various mail-enabled transports and OLE 2 (ActiveX) abilities. We examined integration with the Internet and considered how well the applications operated during light multitasking. In addition, we evaluated the product's macro or programming facility.

We rated on-line documentation and help systems for breadth, depth and quality.

Finally, we rated the cost of the product compared with other suites.

Look at the KV-SS25 Again

I normally don't respond to product reviews, but your review of the KV-SS25 in *Government Best Buys* compels me to. Apparently there was a major miscommunication between the *FCW* reviewer and our representative. The KV-SS25 is referred to in our literature as a low-end document imaging production scanner. Unfortunately, I think the term "low end" gave the reviewer the impression that this product was competing against low-end flatbed scanners that are bundled with various software packages. Our production scanners are designed with the durability to process volumes of documents.

Traditionally, this type of scanner is sold by a VAR as part of a complete document imaging solution that includes a sophisticated software package. To compete in this environment, we bundle drivers and a scan and store program that will allow the VAR to test the unit before delivering it as part of the complete system.

According to a recent report by *InfoTrends*, the KV-SS25 grabbed a significant percentage of the production scanner market faster than almost any other scanner in history because of its excellent feature set.

InfoTrends feels the KV-SS25 will dictate the competitive features of production scanners for the foreseeable future.

Perhaps you'll consider re-evaluating the KV-SS25 so that your readers can have the opportunity to see it in an accurate editorial context.

Nick Morisco
National Sales & Marketing Mgr.
Imaging Systems Division
Panasonic Computer
Peripheral Co.

Editor's reply:

We have agreed to take a second look at the KV-SS25 and will run it through its paces with the appropriate third-party software. Readers can look for us to give additional details about the KV-SS25 in an upcoming issue.

Give V-ONE Its Due

I'm a systems engineer at V-ONE. The **www.fcw.com/pubs/gbb/1997/0203/gbb-firewall-2-3-1997.html** Web page you maintain has the following paragraph:

"While remote administration of firewalls raises some security questions — How can you be sure you're the only one changing settings? — the technology for secure communications on public networks is readily available. Packages such as CheckPoint Software Technologies Ltd.'s CheckPoint Firewall-1 2.1 and Trusted Information Systems Inc.'s Gauntlet Internet Firewall provide secure remote administration."

This paragraph fails to mention that V-ONE's SmartWall does provide secure remote administration. That fact is mentioned later in the SmartWall-specific paragraph. In fact, I thought I read elsewhere in your article (and this sounds right, though I'm not sure) that Gauntlet's Internet Firewall does not do so.

Perhaps Gauntlet's name was entered when V-ONE's should have been?

Anyway, thanks for the high marks. Thought you might want it a bit more accurate.

Patrick Belliotti
V-ONE Corp.

Editor's reply:

Yes, you're right. The sentence should have said that firewalls

from CheckPoint and V-ONE provide secure remote administration, while Gauntlet's product does not. Sorry for the typo.

Watch Those Graphics Cards

Regarding your Jan. 6 article, "Graphics Card Affects Performance," I have Gateway PCs (166 MHz) with the ATI Mach 64 [graphics cards], and I also have units with the Matrox Millennium. Gateway will gladly ship their PCs with the Matrox; all you have to do is ask. In some applications, the Mach 64 is actually much faster. In others the Millennium is. . . so don't give benchmarks that much credit.

Also, the Millennium is very funky in the driver department with some applications. MS Flight Sim for Win95 won't run, for example. And the Matrox drivers that load its control panel cause many systems to crash. It can write to locations of memory shared with the BIOS on some systems. New drivers will help. . . but who knows when I'll get them. Each motherboard-BIOS combo must be checked to see if it supports the Millennium.

Also, there is a difference in the OEM and the retail Millennium. The OEM has a slower RAMDAC, so beware. Gateway will ship the retail one if you ask.

John H. Caeruky
Received via e-mail

Editor's reply:

Thanks for your input. We maintain, and you seem to agree, that components such as graphics cards have a significant impact on the overall performance of systems. We recommend Matrox Millennium cards because we've seen them boost performance on real-world applications such as word processing, spreadsheets and databases. Although we have tested these cards in dozens of systems, we have not experienced the driver problems you mention using standard Windows 95 applications.

High Marks for Net Security Story

Congratulations on your recent article, "Internet Security," by Brooks Talley [*GBB*, Feb. 3]. I found the information in *Government Best Buys* to be extremely timely and informative. New markets, new technology and new sources of brainpower across the globe are forcing businesses to fundamentally change in order to compete. Your success in the business world will increasingly depend on your ability to gather, process and communicate information quickly and effectively to anyone, anywhere.

Jimmy A. Castro
Greater Austin
Chamber of Commerce
Austin, Texas

Have something to say about one of these letters or one of the reviews in this month's *Government Best Buys*? Write to us at:

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3141 Fairview Park Drive
Suite 777
Falls Church, Va. 22042

Or e-mail us at: **www.fcw.com/pubs/gbb**, and we'll publish your comments in our next supplement.

Correction

In our March review of PC servers, Compaq Computer Corp.'s score for support policies should have been listed as excellent, with a weighted score of 100.00. The final score remains 9.09.

EAI's Jeff Spencer on an HP workstation. What's your vision?

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ACQUISITION ANSWER MAN

Q. For our multimedia authoring computer, my office is using a Gateway system with a 486 processor (originally 33 MHz, upgraded to 66 MHz) and 16M of RAM. It has a 3.6M hard drive with 2.4M in SCSI. We are using an Adaptec SCSI card, which is at least 2 years old, and connected to it is our CD Writer, a Kodak PCD2000, also more than 2 years old. The CD Writer is a 2X write, .25X read. The machine is running Windows 3.11. Is it worth overhauling this machine, or should we think about purchasing a new machine to do our multimedia authoring?

Tom Sapienza
Forest Service

A. If you're running applications such as Microsoft Corp.'s PowerPoint or other demanding multimedia software, upgrading your system is a must. I recommend a 166 MHz Pentium with 32M of memory, running Window 95 — a solid system for these types of tasks. However, if you're just using the system to press CDs, and you want this process to go a little faster, then upgrading the CD-ROM writer to a 4X-write should accomplish this task.

Q. Just read all the heat the Acquisition Answer Man got for his advice on purchasing RAM in the Feb. 3 supplement of *Government Best Buys.* The problem I found in upgrading my system was not the price nor the amount of RAM needed, but knowing the parity and number of pins —what a nightmare. The vendor would not sell me the memory upgrade without knowing the parity, and Compaq, my computer's manufacturer, was not very helpful. For the longest time, I could not get a straight answer. Weeks later, I was told that parity didn't matter. Where, if anywhere, is this information?

Wilfredo A. Segarra
Defense Department
Antilles Consolidated School System
Aguadilla, Puerto Rico

A. The best advice I have for you is to take the SIMM memory out of the system and take it with you to the store when purchasing upgrade memory. Your other option is to go back to the vendor you bought the system from and buy an upgrade from them.

Q. I'm interested in upgrading our systems to be compatible with communications on the Internet. As a minimum, what do you suggest in terms of processor speed, RAM, hard drive capacity and access time, and monitor view-quality specifications?

Tom Whitman
Via e-mail

A. This is a short question that has a lot of answers. First, are you going to dial in to an Internet service provider over standard analog phone lines? If so, getting a 33.3 kilobit/sec modem that will upgrade to 56.6 kilobit/sec in the near future is your best bet. However, if your agency will use Integrated Services Digital Network, T-1 or T-3 lines to dial up the Internet, then you'll need ISDN modems or compatible LAN equipment.

The next thing you need to figure out is what type of data you will be downloading from the Internet. Text documents don't take up much room. But the minute you get into images and multimedia, your hard drive space will shrink dramatically. Get a 2G or larger hard drive if you're going to be downloading a lot of data from the Internet. You may also want to think about getting a tape backup system, so you can unload and store older data that you're not ready to delete yet.

As far as a computer system goes, anything from a high-end 486 to a Pentium-class computer with 16M to 32M of RAM will meet your needs. As far as a monitor is concerned, you can use any size that you like. What's more important is making sure you buy a quality 64- or 128-bit video card.

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3141 Fairview Park Drive, Suite 777
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COMPILED BY ELANA VARON

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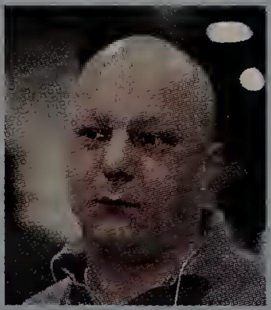
How do you support notebook users on the road?

What types of services do you provide?

PHOTOS BY STAN BAROUH

"We have a site they can dial in to [to] get e-mail. They could also retrieve their documents kept on the file server and get to the Internet."

— Jeffrey Beard, a network analyst with Carroll County, Md., schools, said administrators now use these services when they're working at home, but eventually teachers will have the same access.

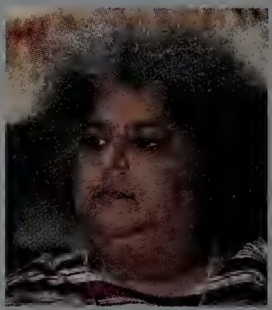


"Pretty much the only thing we have to support is e-mail."

— At the National Park Service, where David Brocato is a computer specialist, a few users can also dial in to the agency to use network applications.

"We can dial in and use applications on our network."

— Jeffrey Earl, an electrical engineer with the National Weather Service, said most notebook users use the service for file transfer and checking e-mail.



"We have remote access to our network, and e-mail."

— Barbara Goldberg, an audit assistant with the Interior Department, said investigators use dial-up connections to transfer files from the road.

"We're working on that."

— Edward Hatcher, a network specialist with the Maryland State Retirement Agency, said notebooks are currently used as stand-alone machines that are loaded with network applications.

"They have e-mail, and we have a couple of examiners that dial in [to the network]."

— Jackie Rodgers, a computer specialist with the Office of Thrift Supervision, said these services help bank examiners get data from agency networks or transfer files to headquarters.

COMNET, WASHINGTON, D.C., FEB. 4, 1997

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Briefs

■ **Entrust Technologies, Inc.** *last week began shipping Entrust/WebCA, a certificate authority management server for issuing* **public-key digital certificates** *for Web browsers. Entrust/Web CA costs $500 and includes 500 certificates.*

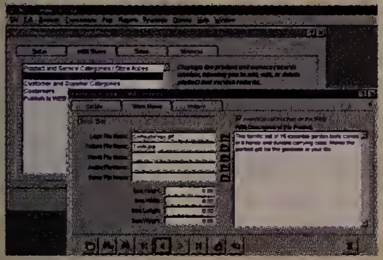
Entrust also released Entrust/ICE, its Integrated Cryptographic Engine for automatically encrypting files when saved in specific folders or when the system shuts down.

Additionally, Entrust announced Entrust/Express for Microsoft Corp. Exchange, an encryption plug-in for Exchange and Outlookscheduled to ship this summer, said Chief Technology Officer Brian O'Higgins.

✆ Entrust: (613) 765-5607

■ **IBM** *has released its* **Java development tool,** *VisualAge for Java, in beta. For more information, see www.software.ibm.com/ad/devdomain.*

■ **Inex Corp.** *today announced two products designed to allow Internet service providers and Web-hosting companies to offer their customers* **electronic storefronts** *on the Internet. Commerce Court Host provides components for ISPs and Web hosts to administer multiple storefronts on the 'Net, while Commerce Court Remote Store enables businesses to manage their storefronts through dial-up or direct Internet access.*



Commerce Court Host is free and available immediately. Remote Store will be available to end users through ISPs and Web-hosting companies. Prices range from $129, for up to 12 products, to $20,000, for an unlimited number of products.

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In-Site

Sun IS given Java mandate

Target is 3,000 NCs on the desktop and 30% of applications converted to Java by July.

By Ellen Messmer
Mountain View, Calif.

When it comes to Java, Scott McNealy is no hypocrite. The Sun Microsystems, Inc. president and CEO has told his MIS department to get Java into the company's internal network as fast as possible. According to McNealy, Sun wants to show the world it "can fly its own airplane."

The job of moving to Java has gone to Bill Raducel, Sun's chief information officer. "We only have 200 [network computers] installed to date, but the goal is to have 3,000 Java computer stations to give users worldwide access over the 'Net through their personal 'Webtop', and 90 applications converted to Java by summer," Raducel said.

"All corporate-level applications for everyone must move to the Webtop by the end of this year," Raducel said. "Every single person's environment must be Webtop, whether it be Solaris, JavaStation, PC or NT." Sun has 25,000 desktop computers and 8,400 servers worldwide.

Sun executives, including McNealy, were among the 200 employees to receive a JavaStation running Sun's first two commercial desktop applications — the HotJava browser and HotJavaViews (*NW*, March 17, page 1).

"This model works as well on the extranet as on the intranet. I can't afford to write three sets of applications."

Bill Raducel, chief information officer, Sun

The next 3,000 to migrate to Sun's Webtop, an HTTP browser-based network, will be English-speaking employees not involved in engineering, Raducel said.

While Sun wants to prove that these 3,000 JavaStation users can go cold turkey on PC, Macintosh or Unix boxes by June 30, "we have given ourselves a hedge," Raducel said.

During the transition, Sun will let JavaStation users get access to X servers so they can use Solaris hosts, Raducel said.

In a mammoth code-writing effort, Sun is building Java applications from scratch.

"Our organization has 6,000 developers in it," Raducel said. Just a year ago, Sun picked one developer to be a "Java evangelist" whose sole mission was to encourage developers to write in Java.

Sun also formed a volunteer group, called the JavaTeam, to teach developers to write Java code. A smaller group, JavaJoint, was formed to refine the application architecture Sun would follow.

And money helped. Raducel offered a $10,000 prize for the first Java applications. "I paid $30,000 in prizes for applications that are probably worth half a million dollars," he said.

"It's amusing, but the first Java application reads MVS printout queues," he said.

Software distribution at Sun is moving toward a demand model, in which servers will let users with HotJava browsers download the application with permission, based on an application's URL.

By summer, Sun wants to convert applications related to personnel management, financial, help desk and sales operations to Java. Because Java is an object-oriented language that will let developers reuse code, "we are building a class repository, and we'll have a librarian," Raducel said. "And we will try to build definitions for reuse."

Ironically, some of the roadblocks to Sun's Java migration have arisen because of the continuous changes Sun's JavaSoft unit made to the underlying Java specification, the Java Development Kit.

Changes have caused the MIS department "some heartburn," Raducel said. "We have tried to understand from the JavaSoft people where they are going, though we've been lagging about three months. We are depending on the releases from JavaSoft this summer because it's moving so fast." ■

Inktomi 'caches' up to the 'Net

By Chris Nerney
Berkeley, Calif.

The company that put itself on the map with the powerful HotBot Internet search engine said it has developed a Solaris-based caching technology that will reduce traffic overload on the 'Net and in corporate intranets.

Inktomi Corp. today announced the development of Sun SPARC-based traffic servers designed to support cache sizes up to 1 terabyte. The traffic servers, or network caches, are expected to be available by late July or early August, company officials said.

The target market for the network caches will be Internet service providers and large corporations with intranets, according to Richard Pierce, Inktomi vice president of marketing.

The traffic servers are based on the clustering technology Inktomi has used in its search engines. The technology allows servers to be linked together, forming a virtual networkwide cache, said Eric Brewer, Inktomi's chief technology officer.

PROFILE: Inktomi Corp.

Founded:	February 1996, by Eric Brewer and Paul Gauthier
Location:	Berkeley, Calif.
Employees:	35
Investors:	Oak Investment Partners
Product:	Search engines
Coming soon:	Network caches

NetworkWorld Fusion
Inktomi is better known for its Web spider/search engine. Read how these spiders work and get tips on how to get your site listed on Inktomi and other search sites.
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All browsers use client-side caches to store frequently viewed pages, he said, but such caches have limited capacity.

By "extending caching into the network infrastructure," Brewer said Inktomi's traffic servers can be upgraded as the number of users and amount of data moving across a network increase.

Storing data on the network as close as possible to the user also will minimize access time and system traffic, he said.

Beta testing is slated to begin in June.

Inktomi was founded in February 1996 by Brewer, then a computer science professor at the University of California at Berkeley, and graduate student Paul Gauthier.

Former Sybase, Inc. CEO David Peterschmidt joined Inktomi as CEO last July.

The company also announced today that it is receiving $8 million in venture capital from Oak Investment Partners.

Pricing for the traffic servers has not been determined.

✆ Inktomi: (510) 883-7300

'NET INSIDER

The parent revolution

Willa Cather was speaking of the life of homesteaders when she wrote in *O Pioneers!*, "There are only two or three human stories, and they go on repeating themselves as fiercely as if they had never happened before." But surely one of the most fiercely repeated stories is the fear of new technology and its impact. We are seeing that fear, yet again, in the "news" coverage of the Heaven's Gate story.

From Victor Hugo's Dom Claude Frollo fearing that the printing press would destroy the church, to Ned Ludd breaking frames for automatic weaving machines, to legislatures increasing the penalty of a crime that has existed for millennia because it involved the Internet in some way, the advent of advanced (for our time) technology seems to kick off irrationality in some people. This type of irrationality is painfully clear in the news stories and commentary that has resulted from the Heaven's Gate members "discarding their containers."

This group had been in existence for more than 20 years and did almost all of its recruitment the old-fashioned way — using printed flyers. Yet, the fact that they made money by creating Web pages has been part of almost all of the stories I've seen. Why should they be referred to as the "UFO and Internet cult" rather than the "UFO and Xerox machine cult?" It is because the 'Net is currently an easy target. It is seen as somewhere between vaguely sinister and the personification of evil. Interestingly enough, these characterizations can be made by the same people who are working hard to bring the 'Net into every classroom. But consistency is no more of a common trait in demagogues than is logical thinking.

In one of the many parts of *The Hunchback of Notre Dame* that does not refer to cathedrals and gypsies, Hugo writes, "The invention of printing was the greatest event in history. It was the parent revolution; it was the fundamental change in mankind's mode of expression. . .When put into print, thought is more imperishable than ever; it is volatile, intangible, indestructible; it mingles with the air." The power of transcribed thought was then seen as as much of a danger to the way that things should be as the industrial revolution years later. All too often people have tried to suppress this power by banning or burning books.

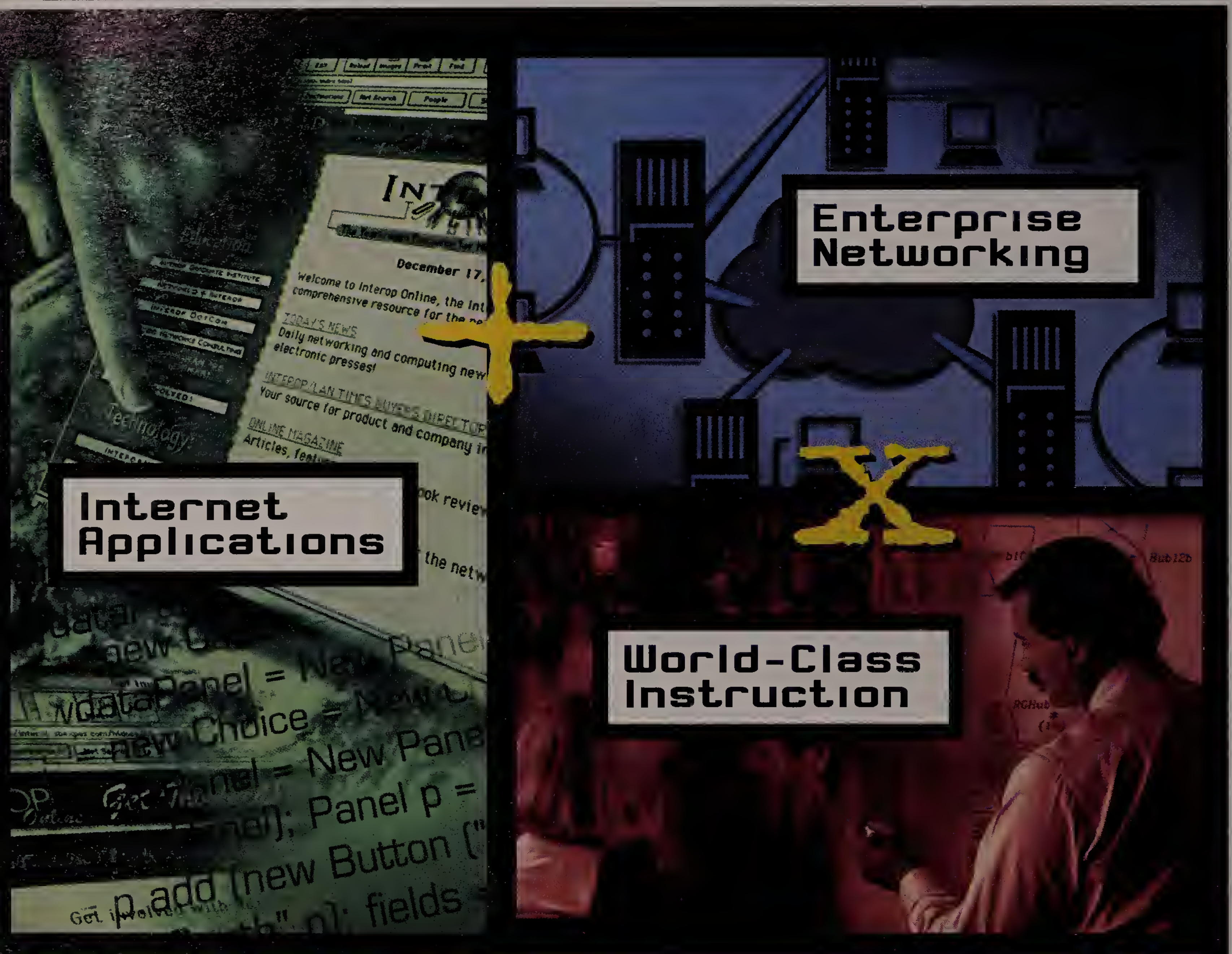
Scott Bradner

In the long, and usually even short run, this is futile — burning a book does not destroy the thoughts within. Note that this power can reflect the good and the evil in the heart of the writer.

It is too early to know if the Internet is another parent revolution. The leaders of the 15th century feared the printing press because, "A book is so quickly made, costs so little, and can go so far!" The Internet clearly does an even better job at disseminating ideas. Ideas can be made quicker and more cheaply and distributed faster and further than can any printed work. This has already made the 'Net more suspect than was printing in its day. We will see more fear and its attendant calls for the "control" of the Internet as we progress on this new revolution.

Disclaimer: Harvard, with its own Gutenberg Bible and a few million other books, has shown little fear in this area, but the above mutterings are my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



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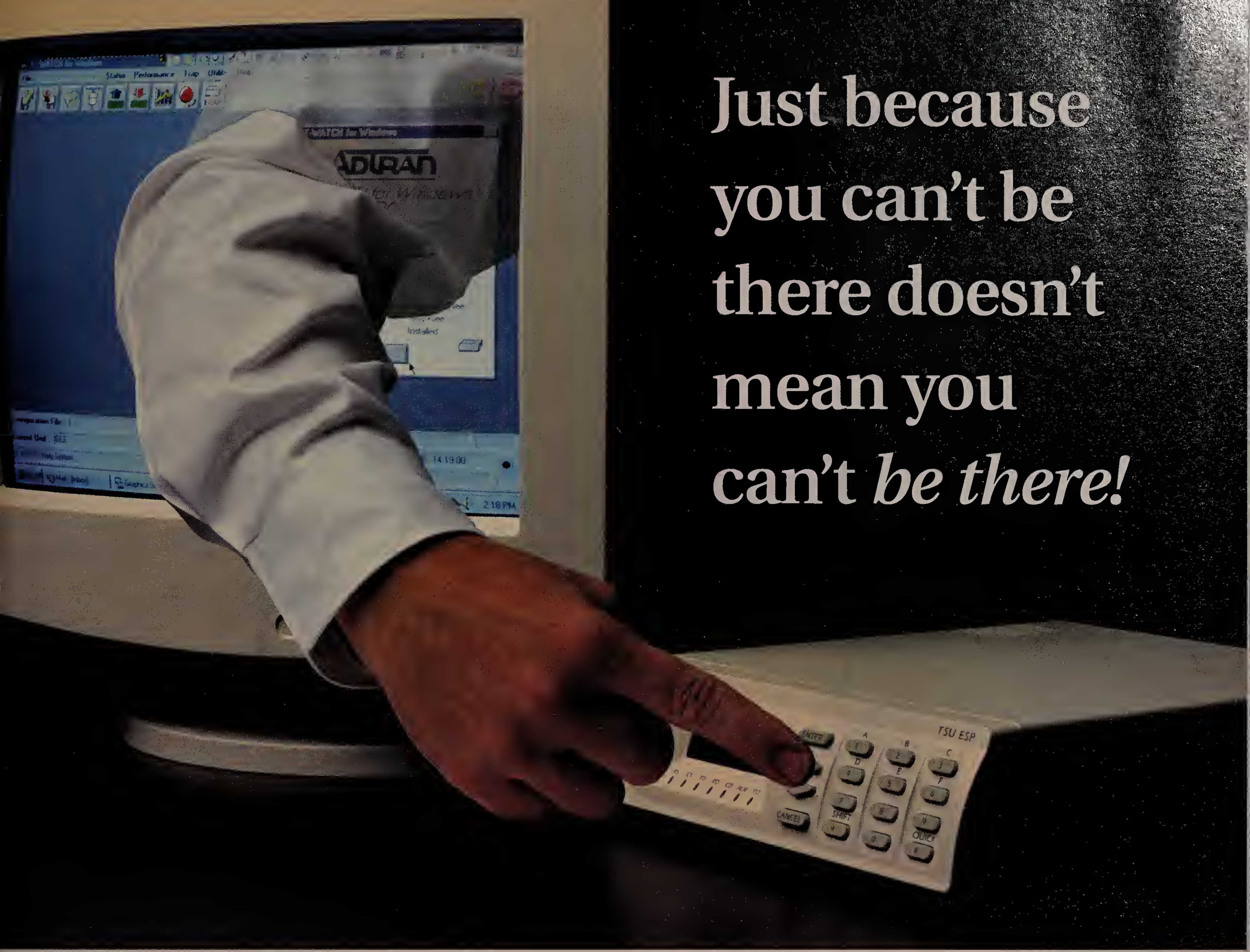
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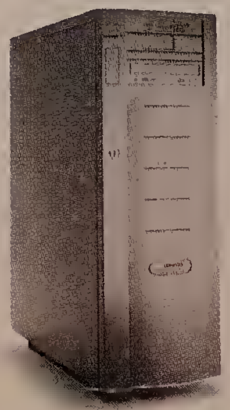

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Under a NetWare 4.1 environment, I installed a Microsoft Corp. Office95 server and then, at a workstation, opened WinInstall and installed the client side.

We only had one CD-ROM, with more than 40 user licenses, from which to install. But every time a user attempts to access a file that is already open, the user gets this message: "File in use by Angelo (my name in the normal.dot file), opening in read-only mode."

How can I correct this problem? Via the Internet

The most likely culprit is the file path used for the templates. Look at the Microsoft Word setup at several of the workstations at which the problem occurs. You'll probably notice the template file path is the same path for all users. To fix the problem, change the path to something different and copy the template files into the new directory.

I have had to create a directory under the user home directory and map a search drive to it so each user could have a personal template directory. Although this means additional work when setting up an application, this step can provide the flexibility needed to accommodate user requests for unique configuration settings.

Another way around the problem would be flagging the files "Sharable Read Only." However, this would mean users could not customize the templates. You could use the "Sharable Read Write" flag to allow changes to the template files, but all users would have to set up their own default files.

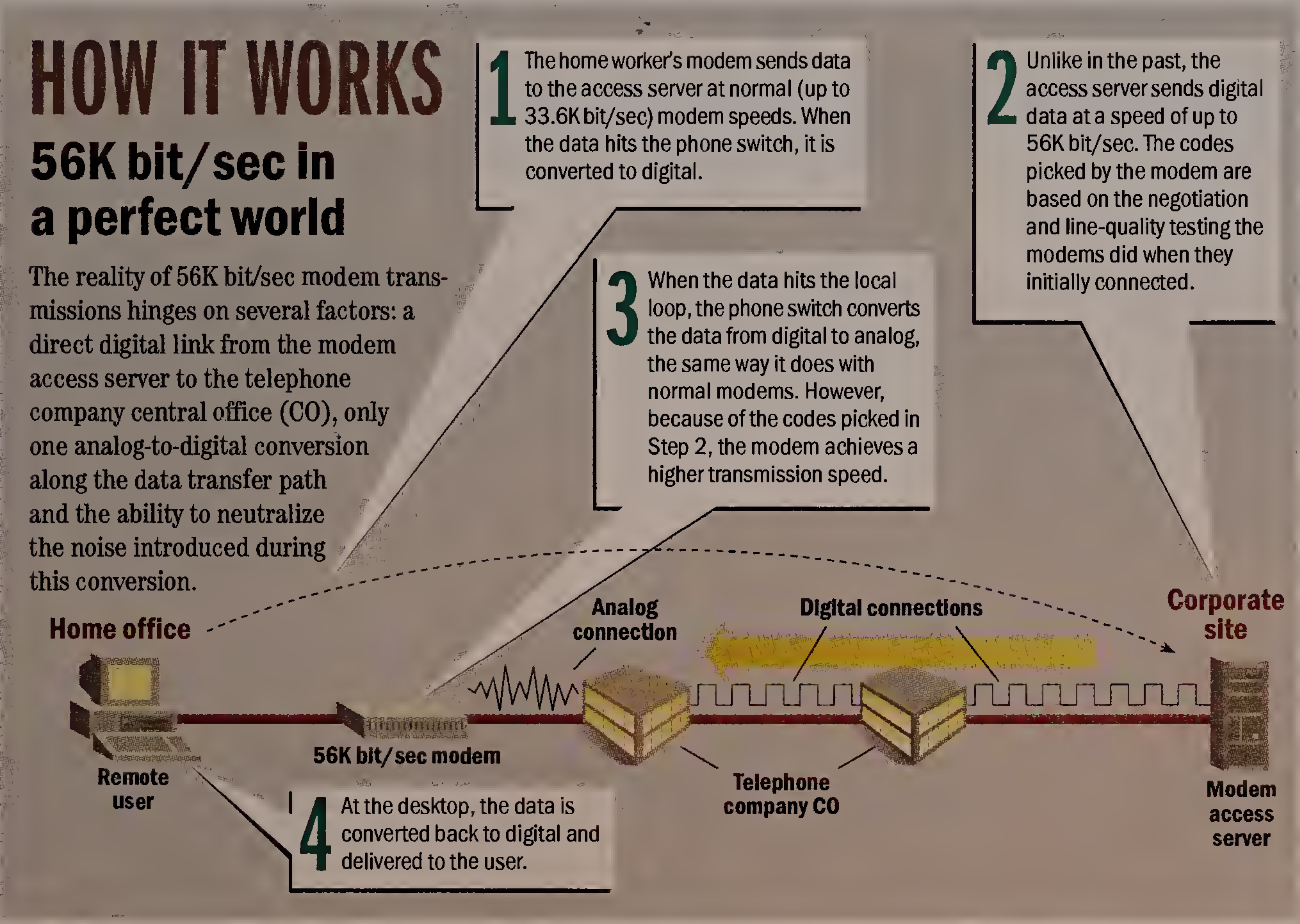
If the problem persists, consider installing Novell, Inc.'s latest 32-bit clients, even though they're presumably for IntranetWare. In addition, delete any temporary files that may be hanging around on the local hard drive or any temporary files that may have been left on the server when a workstation was hung up or a user didn't properly exit the program.

56K bit/sec modems offer promise, but pitfalls, too

By Tim McShane

While new 56K bit/sec modems hold the allure of transforming a cruise on the World-Wide Web or a remote dial-up session from a frustrating to a dynamic experience, users need to be aware of potential performance issues.

As its name suggests, 56K bit/sec technology should connect users to data much faster over regular phone lines than currently installed standard modems, which operate at 33.6K bit/sec. However, the first 56K bit/sec modems are shipping with promise . . . and peril.



HOW IT WORKS

56K bit/sec in a perfect world

The reality of 56K bit/sec modem transmissions hinges on several factors: a direct digital link from the modem access server to the telephone company central office (CO), only one analog-to-digital conversion along the data transfer path and the ability to neutralize the noise introduced during this conversion.

1 The home worker's modem sends data to the access server at normal (up to 33.6K bit/sec) modem speeds. When the data hits the phone switch, it is converted to digital.

2 Unlike in the past, the access server sends digital data at a speed of up to 56K bit/sec. The codes picked by the modem are based on the negotiation and line-quality testing the modems did when they initially connected.

3 When the data hits the local loop, the phone switch converts the data from digital to analog, the same way it does with normal modems. However, because of the codes picked in Step 2, the modem achieves a higher transmission speed.

4 At the desktop, the data is converted back to digital and delivered to the user.

Three central assumptions are driving the development of 56K bit/sec technology. The first is that the public telephone network is increasingly becoming a digital network that can support high-speed connections. The second assumption is that Internet service providers are installing digital links to the upgraded network through channelized T-1 or ISDN lines. The last assumption holds that noise, which degrades data transfer rates, can be equalized on the client side when downstream Internet data hits the last remaining analog piece on the public lines.

If any of these factors do not apply to a particular connection, the user will not be able to achieve a data transfer rate much faster than 33.6K bit/sec.

Unfortunately, users have to buy, install and place calls using 56K bit/sec modems to discover if they will benefit from the technology. An ISP might support 56K bit/sec transmissions, but if the data is subjected to more than one analog-to-digital conversion as it moves across the network, the call cannot be carried at 56K bit/sec.

Ringing out the noise

To transfer digital data across the analog local loop, sending and receiving modems transform incoming digital signals into their analog equivalents. While a necessary process, modulation also creates noise that significantly reduces the achievable throughput rate. Without such noise, the data transfer rate over a communications path would approach the theoretical limit of 64K bit/sec.

In the past, analog modems have been technically unable to reduce or equalize noise. Reducing the noise seemed impossible because most data transfers encountered multiple points of modulation on the client and server sides. Equalizing noise at numerous points appeared too difficult, resulting in modems that assumed data could be transferred at a rate no greater than 33.6K bit/sec.

However, with ISPs installing digital links on the server side, modem manufacturers recognized an opportunity to increase data transfer speeds by equalizing noise on the client side. Manufacturers have done this by treating the noise as a known impairment that could be directly counterbalanced. Previously, the noise was regarded as random and unable to be equalized.

By identifying and equalizing each noise source, the data signal could be directly translated from digital to analog as it passed through the analog local loop. In other words, the noise now theoretically could be neutralized, resulting in little loss of throughput.

For example, an ISP server with a direct digital link to a telephone company's central office receives a user's request for information. In responding, the server sends the requested data through the phone company's digital network. The message stays digital until it hits the analog local loop.

At that point, modulation converts the digital message into an analog message for delivery over the local loop and to the user. Along the way, the noise is equalized and a direct translation is made from digital to analog. A final analog-to-digital conversion is made at the desktop by the user's modem, leaving the user with a downstream data rate of about 56K bit/sec. Bit signaling robs the modem of approximately 8K bit/sec, making it impossible to attain the theoretical transfer rate of 64K bit/sec.

Pitfalls of 56K

Unfortunately, 56K bit/sec modem technology does not exist in a perfect world.

Tests conducted by independent labs have shown that most users can expect only about a 20% increase in data speed over 33.6K bit/sec technology. To make matters more troublesome, even the promise of 56K bit/sec holds only for the downlink. Users shouldn't expect any improvement on the uplink.

To further complicate this situation, 56K bit/sec products are being developed to two different standards — one promoted by Rockwell International Corp. and the other by U.S. Robotics. Before buying a 56K bit/sec modem, users will have to find out which standard their ISP supports.

Indeed, 56K bit/sec modem technology holds potential and hazards. Fairly warned, it may be worth the risk for some users.

McShane is senior product-line manager at Cisco Systems, Inc.'s Access Business Unit in San Jose, Calif. He can be reached via the Internet at tmcshane@cisco.com.

Rather than closing the door to get some work done, why not invite everyone into your

office instead?

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[FasTrak ATM]

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EDITORIAL *insights*

The milk mustache of security

There was one thing the industry leaders who took part in my Town Meeting at the Internet Commerce Expo last week agreed upon: Security remains the biggest obstacle to electronic commerce.

Many individuals are wary of doing business over the Internet and a fair number of corporations are leery of linking up to one another — despite the potential for opening new markets and slicing costs.

The promise of a networked economy is being held hostage to overblown security worries, which is costing all companies in lost sales, particularly high-tech vendors.

This fear doesn't stem from a lack of technology available to protect networks. What's missing is corporate resolve or vision. We need a sea change in the way business leaders think.

Unfortunately, that kind of change could be years in coming. Unless, of course, something or someone pushes the process faster — like maybe the high-tech industry?

Why haven't vendors done more to convince customers that electronic commerce is safe? Despite the potential for billions of dollars in product sales to support network-based commerce, the key hardware and software companies remain largely mute on the security issue.

When it comes to business-to-consumer commerce, vendors such as Cisco, Netscape, Microsoft and IBM should be pressuring credit card companies like Visa and MasterCard to promote 'Net sales. Rather than blathering on about who doesn't accept the American Express card, tell me who's selling interesting things on the Web and promise me you'll protect me from fraud.

The credit card companies are probably worried about irritating brick-and-mortar stores that fear the Web, but their backing would go a long way toward pushing timid cardholders into a spending spree.

When it comes to business-to-business electronic commerce, vendors have to lead by example. Having companies like Cisco and Dell actively market and support customers over the Web is the best way to convince other companies that it's time to get wired into their business partners.

One audience member — Gary Beach, my former boss and the CEO of Computerworld — offered an unusual suggestion to the assemblage of execs: Why not steal an idea from the dairy association and start an ad campaign to boost electronic commerce's image?

Instead of having George Clooney or Christie Brinkley with a milk mustache, we could have Bill Gates or Lou Gerstner flashing big grins as they buy a book online.

Hey, it just might work.

John Gallant, editor in chief jgallant@nww.com

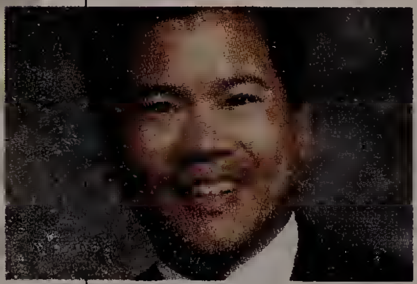
Venture Over the Horizon • Kevin Fong

The old telephone network gets a face-lift

As a venture capitalist, one question I'm always asked is "What's hot?" When I step back and look at what has happened in the communications area over the past year, I would have to say the answer is companies and technologies that are reinventing the telephone network.

The demands of the Internet and other online data requirements are straining the existing public switched telephone network (PSTN). Within two years, data traffic will surpass voice on the public network in terms of bits transmitted and revenues.

The same crossover occurred in the early 1990s with corporate traffic. Corporations saw data exceed voice traffic, with the result being their networks changed from circuit- to packet-based. The public network will duplicate this architectural change.



The technology that forms the basis for this new public network has been developed in corporate networks over the past 10 years by companies such as Cisco Systems, Inc., 3Com Corp., FORE Systems, Inc. and Bay Networks, Inc. These companies have gained extensive expertise in the same IP network technology that is crucial to the build-out of the Internet's infrastructure. Some products that exist today for corporate networks will work just fine for the Internet service providers and telcos. These include giant Gigabit Ethernet switches and many of Cisco's existing and planned larger routers.

But many ISP and telco requirements are different from those of corporate networks. For one, management of the network for purposes of determining who called where is much more complex. Network reliability must be high because losing service directly affects an ISP's bottom line.

Finally, although the PSTN is an order of magnitude more complex than a corporate network, it must be extremely cost-effective. This directly affects the system architecture.

These differences create opportunities for new companies because, while large corporate providers certainly have the capability to provide new equipment, they may not choose to focus their attention on the evolving PSTN, at least in the near term.

One such opportunity lies in the handling of the copper wiring, known as the local loop, that extends from the central office to the subscriber's premises. At least 10 xDSL companies are pursuing ways to use this wiring for high-speed data access and voice.

Companies such as Copper Mountain Networks, Inc., Diamond Lane Communications Corp., GoDigital Telecommunications, AccessLan Communications, Inc. and more established companies such as Westell, Inc. and Amati Communications Corp. are all working in this area.

The small office/home office market is another point of intersection between the PSTN and the Internet. As the trend toward using the Internet to connect workers to the corporate net continues to grow, the home office will need more sophisticated voice and data communications devices.

Whistle Communications, Inc. in Foster City, Calif., provides the small office with LAN Internet connectivity, a Web-hosting platform, a mail server and Web site development tools — all in a turnkey box.

The rebuilding of the telephone network, which will take place over the next decade, promises to be an exciting time for those of us in the networking business. Hardware and software investments in the PSTN Internet infrastructure will have a direct impact on managers setting up extranets for employees and customers.

For venture capitalists, the opportunities for investment look just as promising.

Fong is a general partner of Mayfield Fund, a venture capital firm in Menlo Park, Calif. He can be reached via the Internet at kfong@mayfield.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Sixty-cent debate

David Rohde's editorial "Sixty cents per hour" (March 17, page 36), brings a measure of calm to the firestorm surrounding Internet service provider acces charges. Many Internet users are almost automatically up in arms at any attempt t regulate, price-fix, monopolize or otherwise mess with the Internet.

I think a fractional, almost miniscule charge added to an ISP's costs (and therefore passed on to users) would not be a bad thing, particularly if it helps the regional Bell operating companies revamp the lines in order to build for the future. I would also favor some way to gauge how deeply the phone

Above the cloud • *James Kobielus*

Stemming the push software flood

Push software is on the verge of becoming a bit too pushy as it moves into the realm of electronic software distribution (ESD).

We will soon be bombarded with more free, advertiser-supported, network-downloadable software than one ever dreamed possible thanks to new push ESD environments such as Marimba Inc.'s Castanet.

Castanet lets publishers transmit Java applets, software packages and tons of information to a browser or a specialized new client environment called a tuner.

The Castanet Tuner, available free of charge from www.marimba.com, lets users subscribe online to a range of self-updating applications and real-time content feeds, which emanate from Web servers running Marimba's transmitter software.

Marimba's list of strategic partners shows that Castanet is on its way to becoming a Web software standard. Most notably, Netscape Communications Corp. has committed to incorporating Castanet Tuner in its upcoming browser-based push environment named Constellation.

But Marimba doesn't have the push-oriented Internet ESD market all to itself. Microsoft Corp. has announced it will embed the tuner of a rival vendor, BackWeb Technologies, Inc., in version 4.0 of Internet Explorer.

Both tuner vendors will also port their software to the rival browser — Marimba to Internet Explorer and BackWeb to Constellation.

Within the next two years we can expect to see tuners embedded in most commercial browsers, operating systems and network-enabled applications. Tuners also will be on corporate intranets, where they will provide a much-needed delivery mechanism for software upgrades and bug fixes.

Rest assured, none of this push software/content will be forced down users' throats. Users will have the option of not subscribing to a particular tuner channel or dropping any channel they've previously subscribed to.

However, early adopters will use tuners to subscribe to any software/content channel that looks remotely interesting, much the way some browser users have never hit a Web site they didn't bookmark. Network managers are going to have to find a way to keep users from downloading everything in sight in this new push-oriented tuner/browser environment.

Users will need desktop tools to help them decide which push channels, applications and data to retain and which to purge.

This is where Microsoft's proposed Channel Definition Format (CDF) may come in handy. Circulated recently for industry comment (www.microsoft.com standards/cdf.htm), the specification's preliminary draft lays out an open specification for Web publishers to tag, index and list their online offerings to facilitate selection, retrieval and management by push browsers over the Internet or intranets.

MAHTY BRAUN

CDF defines content-tagging attributes such as title, author, publisher, keywords, category, storage size, and last modification date and time. If supported by many electronic publishers, the specification would let users customize their push environments by selecting software and news feeds from multiple sources, identified by browsing CDF-formatted program listings.

One critical thing missing from the CDF preliminary draft is explicit indicators of the "purge-worthiness" of a push channel, downloaded application or file, which would help the user determine what to dump and what to keep when disk space is limited. Obviously storage size and publication date are important indicators of purge-worthiness, insofar as ancient, disk-hogging objects are usually prime candidates for the ax.

But there also need to be explicit indicators of a channel or application's transaction history vis-a-vis a particular user. Did the users specifically order and pay for the channels or software or were they pushed at the vendors' initiative free of charge? Is the item a paid-in-full licensed application or a now-expired 30-day trial package?

CDF's user-tracking profile — now just sketchily outlined — needs to interface with electronic commerce systems to extract these transaction-relevant attributes.

Eventually, maybe corporate intranet managers will be able to configure all desktops browsers/tuners to automatically delete local applications and channel items according to various purge specifications.

Push ESD is coming to your intranet faster than you think.

You need to help define the parameters of this new technology before it gets out of hand and floods your servers and desktops with a plague of junk software and data.

Familiarize yourself with the CDF draft and send your comments to the document's author, Castedo Ellerman, at castedoe@microsoft.com.

Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC International, Inc., a McLean, Va.-based network design, engineering and integration firm. He can be reached at (703) 873-2474 or via the Internet at kobielus_james@lccinc.com. The opinions expressed are his own.*

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companies dig into their own well-lined pockets to meet the demand.

In the absence of any such public system of verification, I agree with the view that it's critical to see the RBOCs pay first. Until that happens, a computer phone call should not be taxed at a higher rate than a plain-old call across town.

Gollo Garcia
Dallas

I am typically online 11 hours each weekday and eight hours each Saturday and Sunday, and I continue my research into the evening at home.

David Rohde is proposing that I immediately pay an additional $284 and enjoy it. He makes a strong case to have AT&T restored; bring all the baby Bells back under one fold and this would never be an issue.

As part of my "other life," I help less-privileged kids in the inner city four times a week. We use old surplus government PCs and get cheap Internet service. A simple $1 per hour would prevent these kids from using the Internet.

To me, Rohde's pitch is pure elitism. If the providers must charge all phone users a little more to keep their profits evergreen, so be it. But to specifically exclude an entire class of society from intelligence and information because of money in this age is onerous.

William Maidens
Program manager
Enterprise Information
Services, Inc.
Falls Church, Va.

David Rohde's editorial on the proposed fees to be assessed on Internet service providers for local network access offered good insights into why this could be considered an extra cost for the local-loop providers.

However, the article omitted the fact that the ISPs generally pay business rates for the incoming phone lines they use to provide access. The local exchange carriers (LEC) receive revenue from the ISPs for providing the business lines, which are in turn used as dial-up lines for Internet connections. If the ISPs were not there, the LECs would not have that revenue.

Potentially, this decision could lead to additional per-minute charges levied on businesses using the network for voice traffic, which would meet with even greater opposition.

Don Sykes
Durham, N.C.

Rohde responds: It's a common misunderstanding that an ISP access fee would discriminate against data traffic or lead to a voice access fee. It's the other way around. There already is an access fee on long-distance telephone calls, averaging 3 cents a minute on each end. Think about it: You can leave your Internet connection open all the time and still be charged only $19.95 a month. Keep a phone connection open with a friend across the country, and you'll get a bill for hundreds of dollars.

But I didn't actually propose an Internet access fee. Rather, the editorial asked people to understand the scope of the controversy rather than assume the worst-case scenarios based on hysterical broadcast storms on the Web.

Teletoons

Phil Frank and Joe Troise baba@sfgate.com

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IPv6

THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

The next generation of Internet Protocol — IPv6 will significantly impact your TCP/IP-based internetwork. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol — Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

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9. Learn how to strategically plan your transition from IPv4 to IPv6
10. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Process Software, Sun and others are implementing IPv6
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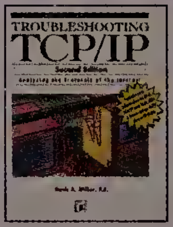

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We've got trouble

Survey shows network and systems management products are merely plugging holes while integration and automation problems loom large.

By Elisabeth Horwitt

ELLEN WEINSTEIN

Alameda Hospital's IT department has been searching in vain for a product that can track "configurations of workstations, servers and network devices," says Mike Moran, director of IS for the Alameda, Calif.-based hospital. So far, he has found tools that address "bits and pieces" of his network and systems management needs, but none that offer integrated management and allow for proactive capacity and budget planning.

"I don't think anyone has what we're looking for yet," Moran says.

Unfortunately, his story is typical of the 200 *Network World* readers, ranging from LAN managers to IT directors, interviewed for the 1997 *Network World* Network Management Survey. Sponsored by Deloitte & Touche Consulting Group and conducted in conjunction with McConnell Consulting, Inc., the survey painted a rather dark picture of user disgruntlement with current network and systems management offerings.

Following two years of steady — albeit not spectacular — increases in satisfaction levels, ratings of network and systems management products this year took a dive almost across the board. On a scale of 1 to 5, with 5 being the best, satisfaction with overall improvement of systems management products dropped from 3.85 in 1996 to 3.44 this year. That's a new low, worse than the 3.5 score in 1994, the first year the survey was conducted.

Behind these numbers is user frustration with vendors that have been promising for years to take the grunt work out of managing multivendor enterprise networks.

"Even though individual point products are getting better, overall solutions are lacking," says John McConnell, president of McConnell Consulting in Boulder, Colo.

David Rosen, a systems consultant at Metropolitan Life Insurance Co., agrees.

"We're breaking up the [enterprise management] problem into workable chunks, like software distribution, server management and router management," he says. "We have a number of tools, but no one tool does the job, and there's a lot of overlap."

To solve their problems, customers are not pinning their hopes on ambitious systems and network management frameworks such as the Tivoli Management Environment (TME) from IBM's Tivoli Systems, Inc. Even fewer survey participants than last year — 19.5% vs. 22% — say they are buying into the framework concept in any fashion.

This is particularly significant given that, according to survey figures, managers now more than ever need the automation, integration and scalability that frameworks are designed to provide.

When respondents were asked to rate the importance of various factors in increasing satisfaction with their management systems, automation-related items took three of the top five spots (see graphic, page 54).

"Users want a management tool to start responding automatically to situations when they're detected," McConnell says. "When a [Remote Monitoring] agent finds your utilization went up, you want something to take action to fix it, rather than turn an icon red and make you figure out what to do."

Similarly, scalability came in at 4.03 out of a possible 5 in terms of importance, while integration of network and systems management data rated 3.85.

Driving this need is a big rise in the number of systems respondents are managing. In 1996, respondents reported managing an average of 21 servers and 225 desktops. This year, the numbers grew to 73 servers and 1,200 desktops.

Users clearly believe current products still don't have the wherewithal to manage such installations. Current automation capabilities got a satisfaction rating of 3.1 on a scale of 1 to 5 in this year's survey, down from 3.57 last year. Satisfaction with integration was down to 3.1 from 3.55 last year.

In addition, functional areas such as accounting, asset management, backup and configuration management took an almost across-the-board drop compared with last year (see graphic, page 52). The only exception to the general downtrend was security tools, which took a miniscule hike from 3.25 to 3.56.

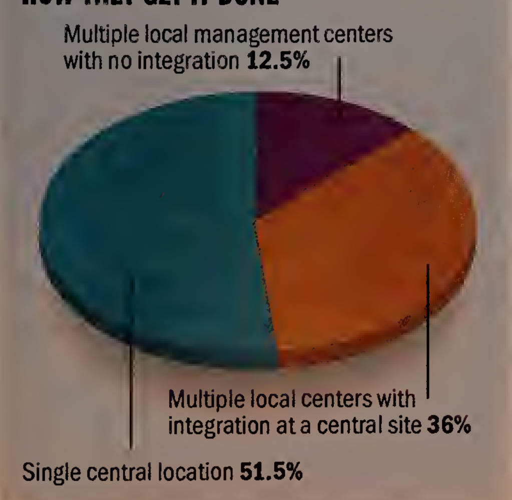
Another major target for users' ire was application management. Last year, survey respondents gave application management systems a 3.9 satisfaction rating on the 1 to 5 scale. This year, the score sank to 3.2, and optimization of application performance plummeted from 3.5 to 2.9.

Here, again, user discontent seemed to center on the inability of tools to provide the big picture. Users want tools to pinpoint, as one user said, which application is hogging network bandwidth or whether a response-time problem lies in the server, the application or a particular network segment.

The problem with platforms

More than any other type of solution, IT departments are looking to fill their

HOW THEY GET IT DONE



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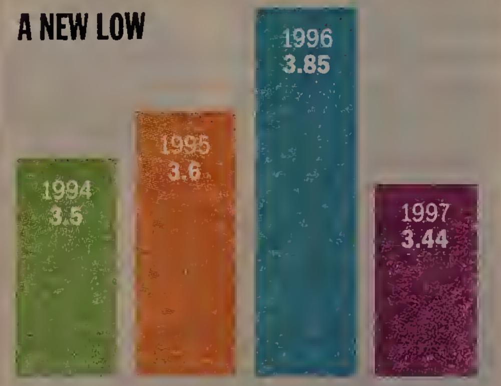

After two years of slow but steady progress, respondents' overall satisfaction with the level of improvement in network and systems management products dipped significantly this year to register a new low. Ratings are based on a scale of 1 to 5, with 5 being extremely satisfied.

network and systems management needs with SNMP-based management platforms such as Hewlett-Packard Co.'s OpenView, Sun Microsystems, Inc.'s Solstice and Cabletron Systems, Inc.'s Spectrum, McConnell says.

Survey figures back this up. This year, 48% of survey respondents said they are using SNMP-based platforms as network and systems management foundations — up from 35% last year.

Such platforms, along with object-oriented offerings such as Tivoli's TME 10 and Computer Associates International, Inc.'s (CA) Unicenter, are said to provide much of what users are demanding. Those demands include automated response to alerts; correlation of system and network alerts to pinpoint problems; automated software distribution across multivendor client systems; and integration of third-party management tools and applications.

HOW HAPPY ARE YOU? APPARENTLY, NOT VERY

In comparing levels of satisfaction with specific aspects of network and systems management over four years of *NW* surveys, it's clear that 1997 is a tough year, with lower ratings in every area except security. Ratings are based on a scale of 1 to 5, with 5 being extremely satisfied.

	1994	1995	1996	1997
Accounting	3.53	3.35	3.55	2.75
Application monitoring	*	*	3.63	3.27
Asset management	3.05	3.20	3.25	2.90
Backup	3.60	3.70	3.85	3.66
Configuration management	*	*	3.63	3.37
Database management	*	*	3.97	3.50
Help desk	*	*	*	3.20
Performance management	*	*	3.70	3.30
Problem management	3.20	3.40	3.48	3.11
Security	3.40	3.45	3.25	3.56
Server management	3.65	3.65	3.85	3.56
Software distribution	3.20	3.30	3.50	2.94
Troubleshooting applications	*	*	3.62	3.13
Optimizing applications	*	*	3.46	2.91

* Question wasn't asked in these years.

Why, then, the big drop in ratings? One likely cause is user perception that the integration provided by such platforms is still neither as broad nor as deep as they would like. This is particularly true when — as is generally the case — a customer refuses to stay within the bounds of the vendors' management applications.

Vendors don't deny this. "The problem is customers usually have something [else] already," such as Intel Corp.'s LANDesk, Microsoft Corp.'s Systems Management Server (SMS) or OpenView, says Martin Neath, vice president of product development at Tivoli. "If you're starting from scratch with TME, you get comprehensive management coverage that runs across 27 [client and server] platforms."

Go online to compare this year's results to those from our 1994, 1995 and 1996 *Network World* Network Management Surveys.

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The fact is corporate network and systems management implementations remain largely fragmented. While 32.5% of the respondents said they are managing everything as an integrated entity, 43.5% are managing various components separately using element managers. Another 22% are managing networks with one set of tools and managing systems with another.

Furthermore, only 2.5% of the survey respondents said they are planning to implement a platform such as TME or CA's Unicenter as a "monolithic" one-vendor solution. Another 17% said they're looking to the frameworks to integrate multiple "best-of-breed" products.

Steve Laperuta, a network developer at Office Depot, Inc., illustrates the problem. "IBM claims NetView/6000 [now known as TME 10 NetView] manages multivendor clients and servers, but it doesn't manage all our platforms," he says. The Delray Beach, Fla., office supplies chain is evaluating SMS as a way to automate a corporatewide rollout of Windows NT.

While SNMP-based platforms such as TME 10 NetView can download software to and collect basic alerts and configuration data from NT using standards such as the Desktop Management Interface, users said SMS provides far more sophisticated capabilities, particularly for Microsoft systems.

Office Depot, for example, is checking out SMS' ability to centrally and automatically configure systems, track assets and distribute software in the company's large, distributed NT installation. "We don't want to have to visit every desktop if we can avoid it," says another Office Depot systems manager, who requested anonymity.

Like many other survey participants, however, Office Depot found that a sophisticated capability such as automation comes at a price. "The procedures involved in developing the automated scripts [with SMS] are pretty involved," the systems manager says.

Furthermore, he says, SMS can't monitor configurations in real time or incipient problems such as CPU overload. Office Depot is now exploring the possibility of tying SMS in with Compaq Computer Corp.'s Insight Manager, which does support real-time systems management. The two systems "do have some interoperability," if only on the screen level, the manager says. "So you can fire off Insight Manager from SMS and vice versa."

Integration still illusive

Alaska Air Group, Inc. is likewise struggling to come up with a strategy for pulling its management fragments into a cohesive infrastructure. "Systems management is on the front burner this year because, within the last year, most of our systems have gone from terminals to PCs," says Larry Connors, a network specialist for the Seattle-based airline group.

The group's IT department is now evaluating Remedy Corp.'s Action Request System help desk system, Connors says. The challenge will be integrating help desk operations with legacy network and systems management applications, potentially using OpenView as the integration point. The goal is to provide help desk people with a single system console from which they can view system and network activity.

"They also should be able to just push buttons to do bypasses, remedy situations or activate alternate routing," Connors says.

That's a key point. Alaska Air and other users made it clear that simply having access to multiple management systems from a single console or being able to launch one management tool from the screen of another is not enough. Users want a deeper level of integration that involves correlation of alarms coming from various management systems, so console operators don't have to troubleshoot problems on their own. This is far from a new problem, of course, but the survey indicates users don't consider it adequately solved.

"To me, the biggest [integration] issue is the lack of a common database" that would enable different management systems to share management information, says Mark Kraus, a network analyst at a financial services company he declined to name. "There's a lot of issues associated with information redundancy." Kraus' firm is now struggling to integrate HP's OpenView with several element managers, such as Cisco Systems, Inc.'s CiscoWorks and Bay Networks, Inc.'s Optivity.

It's not as if management vendors haven't heard about these issues. All of the major management platform vendors have been aggressively extending their systems to third-party applications and tools — and even to rival platforms.

Tivoli, for example, has produced integration modules that enable the TME console to interact with TME NetView,

The standards shuffle

One of the problems in building a truly integrated network and systems management utility is the lack of standards to enable tools to communicate with one another. Or, some would say, the problem is there are too many standards.

The Common Information Model (CIM), due out this month, promises to address that issue by consolidating multiple standards, or at least providing interoperability among tools adhering to different standards. The CIM looks good on paper, but given all the management standards efforts that have come and gone, users and analysts aren't expressing a lot of confidence in CIM.

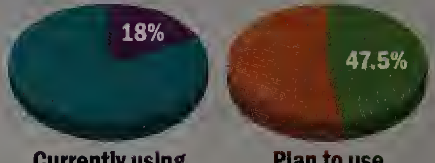
The standards CIM is intended to encompass include the following:

- ■ Java Management API, proposed by Sun Microsystems, Inc. as a more interactive, dynamic interface among Web clients and various management tools and platforms.
- ■ Web-Based Enterprise Management (WBEM), a proposal from a Microsoft Corp.-led group to standardize how management data is represented, manipulated and accessed via a Web browser. WBEM is itself an attempt to integrate existing standards, such as the Desktop Management Interface, SNMP and HTTP.
- ■ Parts of the IBM/Tivoli Systems, Inc. Application Management Specification.

A full roster of industry leaders worked on CIM, under the auspices of the Desktop Management Task Force (DMTF), and have committed to implementing the standard. They include Microsoft, Tivoli, Sun, Novell, Inc., Netscape Communications Corp. and Intel Corp., to name a few.

WEB-BASED TOOLS TO THE RESCUE

Systems managers are increasingly looking to Internet/intranet standards, although not necessarily WBEM, to provide consistency across disparate management tools and platforms, the survey finds. While only 18% of respondents currently use Web-based man-agement tools, another 47.5% say they plan to within the next year.



Currently using Web-based management tools

Plan to use Web-based management tools within the next year

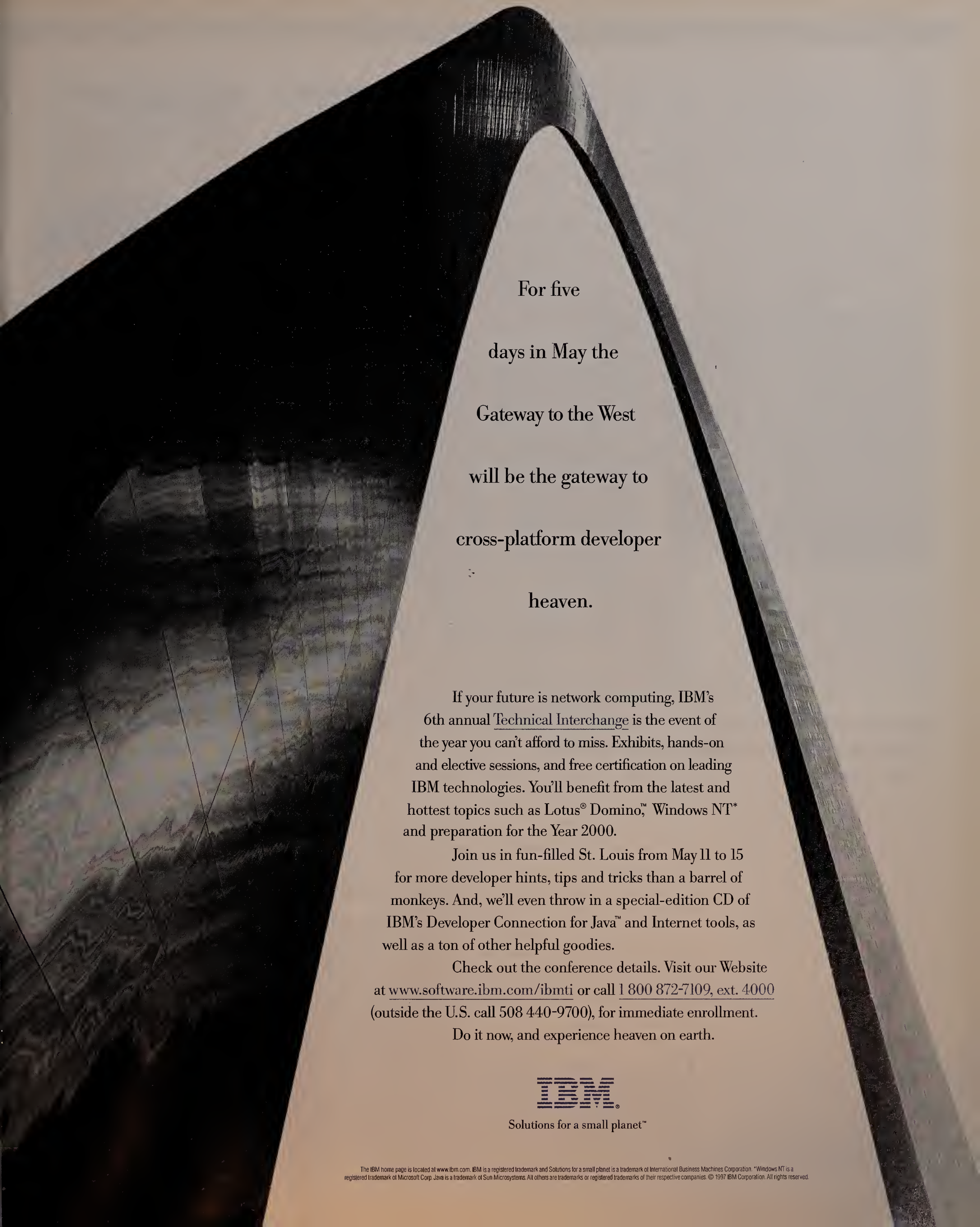
And yet seasoned standards watchers remain cynical about the ultimate success of CIM.

The standard's "goals are quite high and lofty, and perhaps unattainable," says Jeff Case, president of SNMP Research, Inc., a net management software company in Knoxville, Tenn. "When you claim to integrate a lot of existing standards, you generally end up adding one more to be integrated."

Another likely scenario is that some major vendors will "only implement that piece of the standard that is convenient for them, as Microsoft did with [the DMTF's] Desktop Management Interface," says David Spinelli, manager for Deloitte & Touche Consulting Group's global network service line.

"Vendors tend to pursue the 80/20 rule," Case agrees. "Implement 20% of the pieces of a standard that address 80% of the problem."

— *Elisabeth Horwitt*



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SunNet Manager, OpenView and Cabletron's Spectrum, Neath says. And since their merger, IBM and Tivoli have been working for a much deeper level of integration. There are also a number of partnerships, such as Tivoli's recently announced deal with Intel, to integrate TME with LANDesk.

In addition, enterprise management platform vendors such as Tivoli, Cabletron, HP and CA have come up with "de facto" APIs and specifications to facilitate integration into their environments.

Tivoli's 10Plus Association, for example, consists of groups of independent software vendors and partners working on common APIs and object definitions for "specific management disciplines, like backup and archive, help desk and database management," Neath says. The fruit of one such group is the Application Management Specification (AMS), which defines a common data model, managed objects and functions such as installation and configuration. An AMS Builder helps third parties and corporate programmers integrate application components into TME so it can manage any supported system or device.

MAPPING MANAGEMENT NEEDS TO REALITY

The most important factors in improving respondents' level of satisfaction, on a scale of 1 to 5, with 5 being essential:

Having automated processes that provide quick response and better service to end users	4.42
Automating repetitive management tasks	4.26
A scalable systems management solution	4.03
Automated diagnosis and suggestions for fixing problems	3.95
The ability to manage applications remotely	3.95
Integration of systems and application management information with network management information	3.85
A truly distributed systems management solution	3.84
An integrated systems and applications tool set	3.68

Three of the top four factors relate to automation, but the overall level of satisfaction with automation is at its lowest level to date — 3.1 out of a possible 5, a dip from 3.57 last year, 3.4 in 1995 and 3.25 in 1994.

Learning curve

While that sounds like the kind of integration net managers have been demanding, the frameworks don't seem to be catching on in a big way.

One reason may be simple ignorance: Several managers who noted the lack of products providing anything more than screen-level integration also admitted they were just getting around to evaluating products such as TME. Companies such as Alaska Air are still evaluating TME as a possible solution among many.

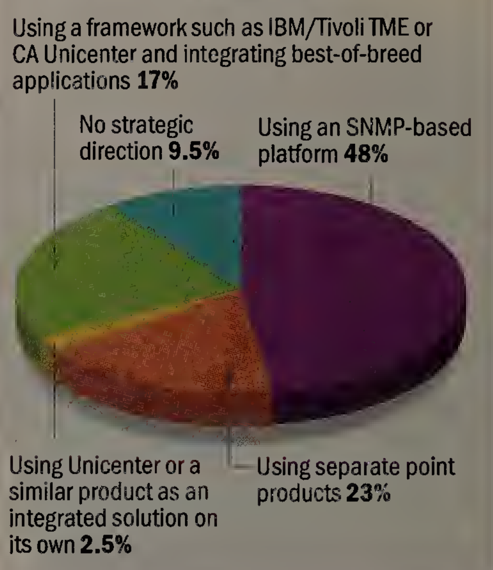
Furthermore, many users have been repeatedly disappointed by vendors that refuse to coalesce around promising standards that would provide fuller integration, says David Spinelli, manager for Deloitte & Touche Consulting Group's global network service line. In particular, the industry needs to agree on a common management data repository structure and managed object definitions that would allow information sharing and correlation across different applications, he says.

The Desktop Management Task Force is expected this month to release its Common Information Model, the industry's latest shot at standard definitions in these areas. However, users and analysts have seen too many similar efforts fail to be optimistic (see story, page 52).

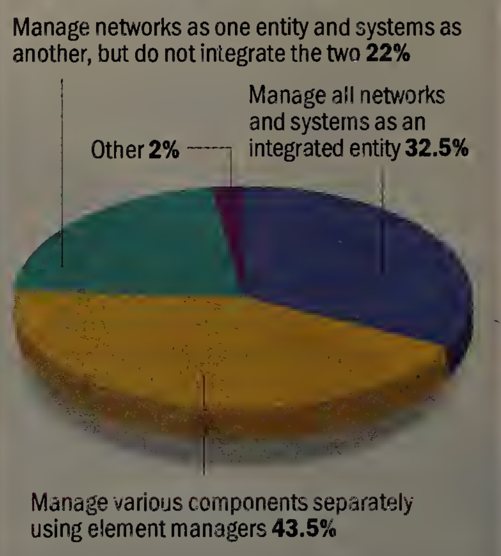
On the other hand, Spinelli says vendors shouldn't shoulder all the blame for the lack of successful framework implementations or enterprisewide integrated management solutions. The problem also lies with IT departments, which he says often underestimate the level of commitment required to successfully implement an enterprise management system.

"When push comes to shove, users are not willing to pay for what we refer to as the development of the people and [business] processes that are applied to the technology," Spinelli says. "They buy the point solutions like software distribution, but they don't have the blueprint to implement them [across the enterprise]. Buying a hammer and nails doesn't mean you can build a house."

STRATEGIC DIRECTION FOR SYSTEMS AND APPLICATION MANAGEMENT



NETWORK VS. SYSTEMS MANAGEMENT: NEVER THE TWAIN SHALL MEET?



Indeed, Tivoli's Neath says designing and implementing a TME system to manage just one major enterprise application — such as Notes or SAP AG's R/3 running across thousands of servers — takes between 120 and 180 days and requires two or three full-time, in-house people and one to three consultants from Tivoli.

Furthermore, building a corporatewide management system requires the same level of planning as an enterprisewide software re-engineering effort, Spinelli says. "According to Gartner Group, [Inc.], 75% of distributed systems management projects fail because there is no plan, no goals or poorly defined objectives," he notes (see story, this page).

When Spinelli's group helps a client set up such a framework, "we typically tell them that 25% of a project's budget is capital outlay, while 75% is project management, process development and change management," he says.

Then there is the difficulty of getting the movers and shakers from the relevant IT groups to commit to the project. "A TME implementation is successful if IT buys into it as a whole, not if only server administrators use it," Spinelli says. A suc-

Keys to success in management projects

By David Spinelli

Too many distributed systems and network management (DSM) projects fail on their first attempt, leaving in their wake significant expenditures without tangible results. Most users blame lack of integration of management products or limitations in the management platforms and frameworks for the disappointments.

The harsh reality is that those factors rarely cause the project's failure. It's more likely that one or more of the following are at the root of the problem:

- Poorly defined goals and objectives.
- Limited planning and poor project management.
- Limited articulation of project goals and objectives to the outside parties that are affected.
- Poor communication and management of changes to the organization and processes.
- Failure to manage "scope creep," the tendency of projects to expand beyond the originally defined goals.
- Unrealistic time alloted for the level of integration effort required.
- Lack of end-user acceptance of the new system and processes.
- Failure to recognize that DSM is a production system and should be treated as such.
- Lack of understanding from IT professionals that they are end users of a DSM system.

If these sound familiar, it may be because a DSM project is no different from any other client/server development project, which means it must be planned and executed in a similar fashion. The DSM project should focus on three basic elements: people, process and technology.

In short, you need to do the following:

- Define the project scope. This should include your organization's agreed-upon definition of the word "management" and a definition of which networked objects will and will not be managed within the scope of the project.
- Develop the management processes. Start with the basic management processes of configuration management, event management, performance management, accounting and security, and apply them to each object you want to manage.
- Realign the organizational structure to support the new management processes.
- Select the technology to implement the management processes.

For DSM to be successful, it must be applied to all IT operational areas and strictly adhered to. Therefore, buy-in from end users — meaning the IT professionals who will use the system day to day — is a key success factor. DSM projects implemented in specific network or systems management silos provide minimal return on investment.

Following these steps should help you avoid the need late in the project to manage the "Fudge Factor" — Fear, Uncertainty and Doubt with Great Expectations.

Spinelli is manager of Deloitte & Touche Consulting Group's global network service line. He can be reached at dspinelli@dttus.com.

Deloitte & Touche Consulting Group

Deloitte & Touche Consulting Group, the sponsor of this year's Network Management Survey, focuses on applying telecommunications expertise to solving business problems. The firm's consultants are typically either business school graduates with an undergraduate focus in telecommunications, or technical people with five to 10 years of consulting experience. The firm has networking centers of expertise in 15 offices around the world.

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cessful enterprise management system "needs information and integration across the security, network management, systems management, desktop management and help desk functions."

A significant number of companies are just starting to put their enterprise systems management strategies together.

For example, Connors admits that Alaska Air IT managers "don't use OpenView as well as we should."

"We have to learn how to use it to deal proactively with problems, [and] we're just starting to look at PC configuration," he says.

Rather than waiting for vendors to come up with more integrated management tools, others have decided to move the mountain to Muhammad: They're simplifying their environments to ease the integration problem.

Metropolitan Life, for example, is coming up with standard configurations for its 10,000-plus workstations, Rosen says. "Then we can start to automate software downloads and updates with something like TME. But without those standard device configurations, we can't manage this problem."

Horwitt is a freelance writer in Waban, Mass. She can be reached via the Internet at 75244.1666@compuserve.com.

The Web is under control — for now

The Internet/intranet explosion isn't yet taking a heavy toll among survey respondents in terms of net management headaches, but warning signs are in the air.

Respondents to the 1997 *Network World* Network Management Survey gave their ability to manage Web servers an average importance rating of 3.0 on a scale of 1 to 5, with 5 being essential. The question was not applicable for 19.5% of respondents. Similarly, the ability to manage Web-based applications was rated 2.9 on average and not applicable to 20% of the respondents.

When asked what missing elements were needed for Internet/intranet management, respondents gave a wide range of answers, from automated help to corporate standards. Perhaps the most common answer was management software.

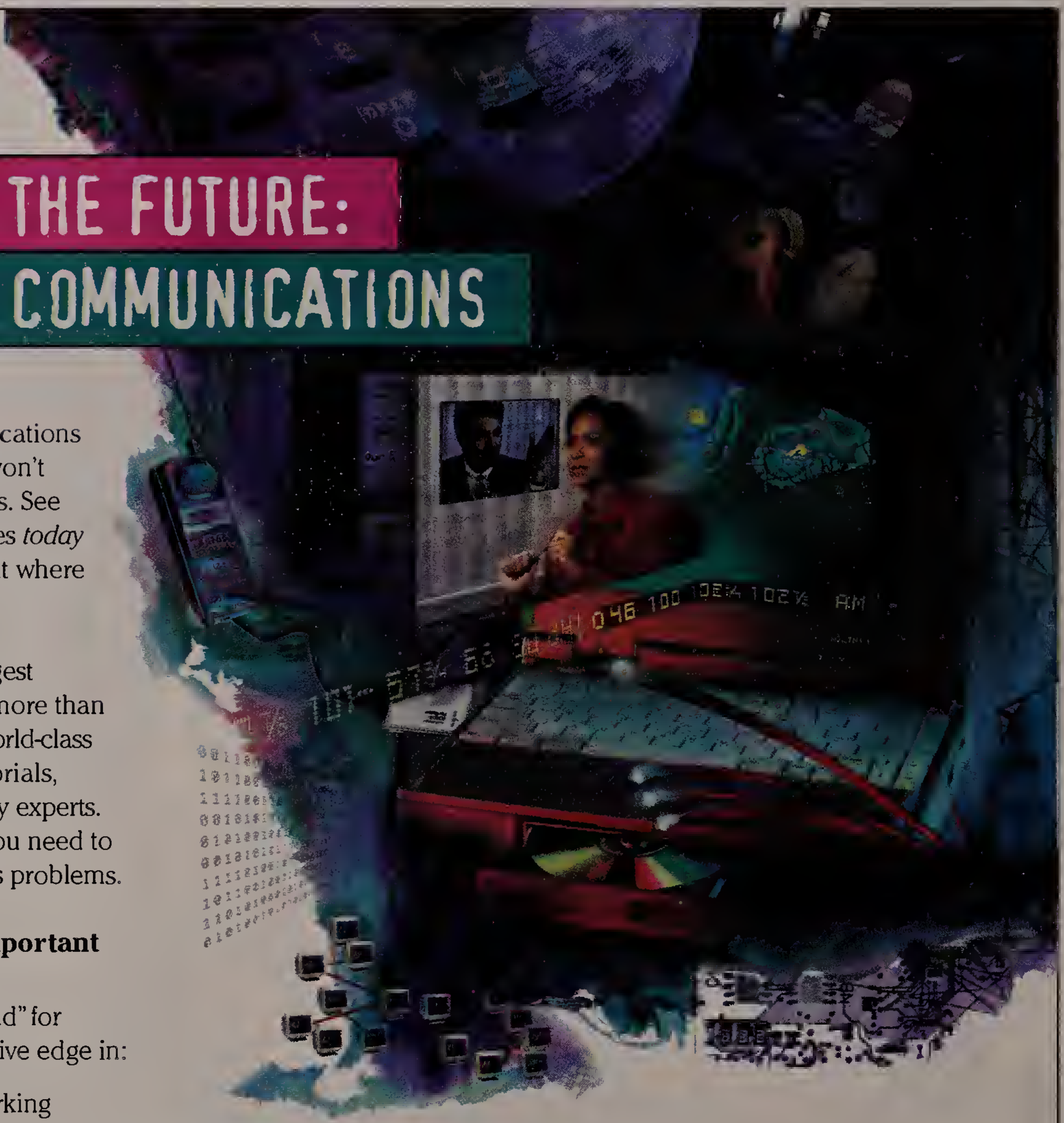
John McConnell, president of McConnell Consulting, Inc., says as intranet installations grow, managers will find themselves dealing with an entirely new set of system and application management challenges, and they will need new tools.

A lot of techniques used in the past simply won't apply "because of the dynamic nature of intranet sites," he says. "For example, when people talk about a baseline in the network and incremental resource usage, this doesn't apply if someone puts in a hot new page and traffic patterns change overnight."

Intranets also impose highly variable traffic loads, McConnell says. "When a user clicks on one of those hyperlinks, you have no idea whether what's coming back is 100 bytes or 100M bytes. So how do you maintain performance levels?"

On the content management side, systems managers will need to "build automated strategies to get the right information in the right place at the right time," McConnell says.

— *Elisabeth Horwitt*



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Ripening on the VINES

Banyan's enterprise network operating system continues to mature.

By Randy Overmyer

NetResults

Product	**VINES 7.0**
Vendor	Banyan Systems, Inc. (508) 898-1000 www.banyan.com
Price	$2,995 for 10 users $7,995 for 50 users $9,995 for 100 users $14,995 for 250 users $27,995 for 500 users
Pros	▲ An easy network operating system to expand into a large network. Easy to maintain on either a department or corporate level.
Cons	▼ Far too many functions are options; even many resellers don't understand what options are needed to get a particular function to work. ▼ Native protocol database server support is weak. Microsoft Corp.'s SQL Server and Oracle Corp.'s DBMS support VINES protocol to some extent.

ScoreCard

	VINES 7.0
Overall score	**8.1**
Naming and directory services (20%)	9
Management/administration (20%)	8
Performance (10%)	8
Networking/connectivity options (10%)	9
Messaging (10%)	7
Security (5%)	7
Enterprise scalability (5%)	9
Stability (5%)	8
Flexibility and ease of use (10%)	7
Installation and documentation (5%)	7

Scores are based on a scale of 1-10. Percentages are the weight given each category in determining the overall score.

Banyan Systems, Inc.'s VINES 7.0 continues to be a stable network operating system (NOS) that is easy to administer. But in terms of attracting new customers, a savings in administrative costs — VINES' chief claim to fame — may not be a compelling enough argument.

Version 7.0 is not a major upgrade in the same way that NetWare 4.0, for example, was a step up from 3.X. In fact, an administrator who is proficient with VINES 3.0 would have little trouble managing a 7.0 server. The server console hasn't changed much, and most of the DOS-based management utilities function the same way.

The biggest enhancements in VINES 7.0 are an enhanced file system and support for long file names.

In 7.0, Banyan also has included the LAN Server-to-Server option, which allows a VINES server to communicate with another server on the same segment at no additional cost. The other new features are simple refinements.

StreetTalk and management services

From the beginning, VINES was designed around its StreetTalk directory service. Every VINES service is StreetTalk-aware, and the administrator's view of the network is network- rather than server-centric.

For example, if you are adding a user to a network that supports mail services on 15 servers, any of the 15 can be used. StreetTalk makes the connection among the users in the various mail services. To the user and the administrator, there is no action required beyond creating the service.

Banyan provides management tools that run under DOS and Windows clients, and 7.0 has nothing new here. DOS and Windows programs offer about the same functions for managing services, users and other StreetTalk objects.

We prefer using the DOS programs because they are available from any DOS or Windows machine on the network. The Windows utilities need to be installed at a workstation.

From the client-based DOS MNET program, you can monitor all critical server functions, such as disk load, network interface card I/O, process utilization memory and routing tables/metrics. The same function is available from the server console. You can compare statistics from different servers by tunneling down from a server list into a specific server or function.

The Windows-based VINES Explorer provides similar and enhanced functions for administration. Users can be managed individually or by groups in a network view of all users. That is, there is no sense that objects belong to any particular server. If you choose, you can designate that each administrator control only certain groups.

Improvements in the file system in 7.0 should make administrators happy. Previous versions of VINES could only support 2G-byte file systems. With servers shipping with 16G- or 20G-byte arrays, this was becoming a serious problem for customers that would find their disk arrays divided into a half-dozen or more partitions. Even more annoying was customers couldn't adjust the way the array was divided.

With VINES 7.0, the maximum disk-volume size has been increased to 16G bytes with a 2G-byte limit per file. A new start-up menu allows you to carve up disk arrays according to your needs. While this pales beside the upper limits allowed under the NT file system, the increase should satisfy most administrators. For others, Banyan's StreetTalk for Windows NT integrates an NT server's file system into a VINES network.

VINES still provides limited native protocol database support, which hurts the NOS' suitability for large sites that are trying to migrate mainframe applications to network servers.

In 7.0, Banyan also added long file name support for Windows 95 and NT. File security is much the same as with any other NOS. Access to file services, directories or files can be limited based on the user's organization, group or user name. In addition, you can create lists of users or services across groups and organizations without any common elements and assign them a common set of access privileges.

Getting the message

An inexpensive option for the VINES server is an E-mail service. This provides a centralized mail database so users can travel around the network, sign on to any PC and read all the E-mail in their folders.

While only one mail service can exist on a server, any number of mail services can exist within the network. These are all tied together with StreetTalk, so administrators don't need to coordinate the mail services. StreetTalk also makes it easier to scale a mail system. Mail services can be added and users' mailboxes transferred to a new service on another server with little or no advanced planning.

For Internet mail, Banyan resells Incognito Software, Inc.'s Intelligent SMTP Gateway for VINES Mail. With this service, a VINES server supports standard SMTP exchanges and automatic attachment file encoding and decoding. This gives users seamless access to Internet mail from their normal VINES mailbox.

Administrators must have Unix access — an optional configuration parameter — and some training to access users' mailboxes. Only the person who installs the server software can allow Unix access to other administrators.

Banyan doesn't provide utilities to view or manipulate folders or message content. Parts of the message header — but not the topic line — may be viewed by the administrator. Through these controls, the employer can decide how much access each network administrator should have to employees' mail — for example, no Unix access, no mail access.

To use the mail service, Banyan includes with VINES a text-based, limited and clumsy DOS E-mail program. As an added cost option, Banyan and third-party vendors provide several Windows-based front ends, some of which include rules-based processing. Plan on spending the extra dough for one of these front ends.

Server installation

VINES installation is menu-driven and well documented. But if you have hardware that isn't supported by the base configuration, you must build a custom kernel during the installation — a tedious process.

The VINES software configures itself according to the characteristics of the hardware platform. In general, the process works well. One common problem for new users, however, is that the default Communication Buffer setting is too low for a server that will see any serious load. Failure to raise the setting, which is not documented in the Server Installation Guide, causes the server to drop connections under load.

With its simple menu-driven administration programs and foolproof protocol routing, VINES is a natural for a company looking to keep network staff to a minimum. Remote VINES servers are easy to install and maintain. With Banyan's optional remote backup package, the server does not need to be visited after the initial install until a hardware failure occurs or an upgrade is required.

While VINES traditionally has been seen as a good product for the largest networks, we think Banyan has missed its mark. VINES is better suited to smaller networks that can't afford the administrative burden some of the other popular NOSes require.

VINES 7.0 is evolutionary, not revolutionary. Its new features are just acknowledgements of changing technology and, in many cases, overdue.

Overmyer is senior technical consultant at Charter Systems, Inc. in Columbus, Ohio. He can be reached at rovermyer@mindspring.com.

Go online for discussions about the pluses and minuses of the VINES IP protocol and VINES backup options, as well as an assessment of Banyan's marketing efforts. 1527

yes

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FOUNDRY NETWORKS vs. ALTEON NETWORKS

HEAD *to* HEAD

Where will Gigabit Ethernet have the most immediate impact: In campus backbones or servers?

BY BOBBY JOHNSON

Gigabit Ethernet's most immediate and tangible benefits will be felt in the backbone. It's a simple fact: Any of today's backbones can benefit from Gigabit Ethernet's performance levels, while only a small percentage of very high-end servers can reap the rewards of 1G bit/sec.

The backbone is the juncture of hundreds to thousands of users in an organization, and the traffic is multifaceted. File transfers, E-mail, 3270 host access, videoconferencing and intranet Web access all traverse the backbone. In a Gigabit Ethernet backbone, all applications are accelerated, not just user-to-server traffic.

In addition, newly available Gigabit and multigigabit Ethernet switches and switching routers can forward a few million packets to tens of millions of packets per second, enabling unprecedented levels of performance that will have an immediate and lasting impact on the backbone.

Empowering servers with gigabit levels of performance is not a simple matter. Many factors affect server performance other than the LAN interface.

The first involves the rates at which data can be delivered to and from the disk drive through the I/O system. Typical disk I/O technologies include Fast/Wide SCSI at 160M bit/sec, Ultra-Fast SCSI at 320M bit/sec and High Performance Parallel Interface and Fibre Channel at 800M bit/sec. Realizing the advantages of Gigabit Ethernet requires an 800M bit/sec to 1G bit/sec disk I/O system.

The second factor involves speeds at which the system's bus delivers data to the CPU. Almost all current PCI systems are 32-bit PCI implementations that deliver data at speeds of 1G bit/sec half-duplex or less. Gigabit Ethernet's potential can't be realized until 1G bit/sec or more is delivered into the system.

Other factors that affect server performance include CPU utilization, operating systems and device driver implementations.

Most important, how many of today's processors can handle a gigabit of packets? Gigabit Ethernet delivers 1.5M packet/sec. If today's processor-based routers are limited to 100,000 to 200,000 packet/sec, won't the majority of today's servers experience the same limitations?

Larger Ethernet frame sizes aren't the answer. This approach will increase server performance slightly. However, the advantage is negated at the switch where fragmentation and reassembly operations reduce throughput to its previous level.

Additionally, such proprietary solutions simply aren't viable in today's multivendor world. It boils down to this: A new generation of servers is needed to leverage the benefits of Gigabit Ethernet.

Gigabit Ethernet uplinks and switches cost approximately $2,000 per port. For servers, the connection cost of a Gigabit Ethernet switch plus adapter ranges from $3,500 to $5,000. A similar server connection for full-duplex Fast Ethernet is $375. Until servers can fully benefit from gigabit links, switched Fast Ethernet is a far better investment.

In the short term, Gigabit Ethernet will be used in campus backbones to accelerate all traffic. A new generation of servers, developed over the next 12 to 24 months, will enable Gigabit Ethernet server connectivity.

This evolution will serve users well because Gigabit Ethernet must proliferate in the backbone to enable gigabit servers.

Johnson is president and CEO of Foundry Networks, Inc., a Gigabit Ethernet equipment vendor in Sunnyvale, Calif. He can be reached at (408) 731-3801 or via the Internet at bj@foundrynet.com.

CINDY CHARLES

BY SELINA LO

The contention that servers are not ready for Gigabit Ethernet this year is just plain wrong. Not only will the server environment be the first place users look to implement Gigabit Ethernet, but it also will be where they'll realize the most significant return on their investment in servers.

Gigabit Ethernet is the best upgrade path for servers that need more than 100M bit/sec of bandwidth. The alternative, aggregating multiple 100M bit/sec interfaces in the server, is much more expensive and management-intensive.

Yes, Fast Ethernet adapters are cheap, but server slots aren't. Even multiport Fast Ethernet adapters require multiple Fast Ethernet switch ports. And routing every packet to the right interface consumes expensive server cycles unnecessarily. A well-designed Gigabit Ethernet adapter can offer two to five times the throughput of Fast Ethernet at a mere two and a half times the cost, and with a 50% or more reduction in host CPU utilization.

There are plenty of server applications that demand multiple 100M bit/sec adapters. The most obvious examples are server backup and database migration. Many enterprises have terabyte databases that can take more than 24 hours to back up over their installed FDDI or Fast Ethernet server LANs. Gigabit Ethernet can cut that time in half or better.

Though many servers can immediately benefit from Gigabit Ethernet, this doesn't mean users will or should rush to upgrade their entire campus backbone to Gigabit Ethernet. Many campus backbone networks may require multiple 100M bit/sec backbone links. But in most cases, the network manager has already implemented a meshed backbone design with load-sharing 100M bit/sec paths between backbone routers or switches. This design is necessary not just for aggregating bandwidth, but also redundancy and reliability.

As backbone traffic continues to grow, it will make sense to replace these 100M bit/sec links with Gigabit Ethernet trunks in congested locations. However, this is dependent on installed routers and switches supporting Gigabit Ethernet uplinks. Such support won't come until mid-1998 at the earliest.

Another issue that will impede an immediate Gigabit Ethernet backbone upgrade is uncertainty about its interoperability with ATM. While Gigabit Ethernet will be deployed in campus backbones, often in parallel with ATM backbones, many net managers will be cautious until interoperability is proven.

Though it's just not practical to upgrade the entire campus backbone to Gigabit Ethernet immediately, servers can still enjoy the cost/performance benefits of Gigabit Ethernet by connecting to a smaller Gigabit Ethernet server switch next to the installed backbone. The server switch provides Gigabit Ethernet connections to servers and one or more Fast Ethernet, FDDI, ATM or Gigabit Ethernet connections to the backbone, depending on the installed backbone technology.

Gigabit Ethernet offers an interconnectivity platform for servers to consolidate their multitude of adapters and off-loads the fast-growing server-to-server traffic, such as bulk data transfers, from the installed client/server backbone. This increases both server-to-server and client/server throughput.

Combining Gigabit Ethernet adapters and smart server switches gives users increased server productivity now, allowing them to wait until they and the rest of the industry are ready to tackle the backbone.

Lo is vice president of products and marketing at Alteon Networks, Inc., a Gigabit Ethernet equipment vendor in San Jose, Calif. She can be reached at (408) 360-5528 or via the Internet at slo@alteon.com.

Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

PC Age Computer Networking School *is shipping a new CD-ROM computer-based training course entitled* **CNE CBT for Windows.**

Intended to prepare you for Novell, Inc.'s Certified Novell Engineer testing, the program includes a glossary of network and NetWare terms, a simulation of Novell CNE tests and interactive exercises. The program costs $1,100 and is available in two versions: one for those with minimum networking or NetWare skills and one for those with more advanced knowledge.

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Dilbert *creator* **Scott Adams** *will give an hour-long presentation called "Humor at Work" on June 25 at the* **ATM Year 97 Conference** *in San Jose, Calif.*

Adams will share the formula for his award-winning humor and reveal some of his rejected Dilbert comics. After his talk, Adams will autograph Dilbert books on the show floor for registered attendees.

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Look for ways to protect your training investment

By Connie Sloane Brown

There are some well-known dilemmas to deal with if you're thinking about going back to school to pick up new skills or certification. One is whether your company will foot the bill, knowing you may demand higher wages or jump ship upon graduation. Then there's the question of whether your courses or certification can be applied toward a college degree.

Educational institutions are starting to address both issues.

ExecuTrain Corp., for example, offers Microsoft Corp., Novell, Inc. and Lotus Development Corp. certification programs with a unique payment plan that protects companies that pay for education.

"We realize that some companies think employees will be too expensive to keep once they become certified," says Kevin Brice, vice president and general manager of ExecuTrain's Technical Training Division in Alpharetta, Ga.

That's why ExecuTrain enables companies to place funds in special tuition accounts under employee names. Any employee who leaves the company two years after starting training must make payments into that account as if they were repaying a loan. The company determines whether tuition is repaid in full or on a prorated basis.

Companies feel secure with their training investment, and employees don't have to shell out anything on their own unless they take new jobs. Of course, this program can be a mixed blessing, too, because your employer knows you have a financial incentive to stay with the company and may not be willing to boost your salary much given that you just got a free education.

If you'd rather foot the bill yourself, many schools will help you get loans.

At Boston University's Corporate Education Center (CEC), for example, students have to shell out anywhere from $5,900 for software development courses to $8,800 for Microsoft or Novell certification. But CEC students can apply for a PLATO Career Education Loan, which is offered through University Support Services, Inc., or a loan offered through The Education Resource Institute (TERI). Both programs are run by nonprofit organizations that extend loans based on creditworthiness. Interest rates are normally a few percentage points above the prime rate, and students have between 10 and 25 years to repay the loans.

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Go online for more links to:

- **ExecuTrain's corporate site**
- **Details about the PLATO loan program**
- **The Education Resources Institute's site, which includes information about student loan programs**
- **A description of the American Council on Education's Program on Non-Collegiate Sponsored Instruction, which helps you to transfer credit from technical courses to college degree programs**

As for the credit transfer issue, there are a number of initiatives under way.

Probably the most extensive is the American Council on Education's Program on Non-Collegiate Sponsored Instruction (PONSI).

Under the program, students taking courses offered by more than 200 educational outlets — ranging from industry associations and labor unions to independent firms such as CommandTrain, Inc., ExecuTrain, Learning Tree International and Productivity Point International — can ask colleges to award course credit toward a degree.

PONSI administrators review all the courses in the program and recommend that colleges accept a specific number of credits for each one.

Some training firms also have their own arrangements with area colleges. For example, Electronic Systems, a computer training facility in Virginia Beach, Va., has partnered with Old Dominion University in Norfolk, Va., to give students the one-time option of applying academic credits toward a full degree in occupational and technical studies with a specialty in network administration.

The program awards nine college credit hours toward a technical degree on a bachelor's or master's level.

This would give an Electronic Systems student Certified Novell Engineer certification, along with a good start toward a technical degree.

Boston University also enables technical training school students to turn their courses into credits toward computer-related degrees, depending on what the objectives are for the college program.

Students must demonstrate the level of knowledge they acquired in specified areas before they can get college courses waived.

Brown is a freelance writer in Virginia Beach and author of the forthcoming book How to Hook a Big Job With a Little Fishing Pole. *She can be reached at (757) 631-9379 or via E-mail at Cbrown1737@aol.com.*

CONFERENCE PLANNING

CONFERENCE: Next Generation Telephony
WHEN: May 28-30
WHERE: San Francisco
SPONSOR: Telecommunications Reports International, Inc.
CONTACT: (800) 822-6338

Internet telephony is catching on. Its use is increasing as transmission and service quality improves and efforts to standardize, overcome bandwidth bottlenecks, and add voice to the Internet are moving forward. Network planners and telecom managers can learn about this technology at a preconference tutorial, "Emerging Telephone Networks and the Internet."

There also will be sessions on building the next-generation network and the applications that run over it, and how to provide local access to that net. Still other sessions cover regulatory and pricing issues. The complete conference with the tutorial costs $1,345 and $995 without. There is a $145 discount for those registering before April 30.

• • •

CONFERENCE: Network Security in the Open Environment
WHEN: June 7-13
WHERE: San Francisco
SPONSOR: Computer Security Institute
CONTACT: (415) 905-2626

Take your pick from more than 60 sessions that cover issues on Windows NT security, secure Internet/intranet access, E-mail security, remote access and telecommuting and electronic commerce.

Two-day preconference tutorials will teach you how to secure your Internet/intranet connections and how to roll out a security awareness program. Tutorials also will help you analyze the security of your business partner relationships. Postconference tutorials run for two days and cover Windows NT security, risk analysis and how to improve your skills as a security professional.

Before May 1, the complete conference will cost Computer Security Institute members $895 and nonmembers $995. Tutorials are $595 for members and $695 for nonmembers.

After May 1, the conference cost will be $945 for members and $1,045 for nonmembers, while tutorials will cost $645 for members and $745 for nonmembers.

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Senior Professor. Tenure-track position available July 1, 1997. Responsibilities include: teaching in technologies applications, planning, development and design of information and communication systems, human factors and related areas in the MS in ICS degree programs; participation in graduate teaching, research and development, and service aspects of Center activities. The center, a ten-year old interdisciplinary graduate/professional program, offers a unique environment with voice, data, video and applications labs in a fully networked campus rich in technology, which forms a living laboratory for faculty and students. Minimum qualifications: appropriate terminal degree in program-related field, such as management, technology, network design, research methods, engineering, human communications or mass communications with emphasis on the information and communication areas in association with both academic and/or industry experiences. Preferred qualifications: Ph.D. in related field or a combination of terminal degree and business/industry experience. Send letter of application, resume, transcripts, and the names and telephone numbers of three references to: Dr. Ray L. Steele, Director, Center of Information and Communication Sciences, Ball State University, Muncie, IN 47306. Review of applications will begin May 2, 1997, and continue until the position is filled.

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DOW

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The following companies will be hiring at one or more of the above events, 9 a.m - 6 p.m.

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	224	225	226	227	228	229	230
Title:	231	232	233	234	235	236	237
	238	239	240	241	242	243	244
Company:	245	246	247	248	249	250	251
	252	253	254	255	256	257	258
Phone: ( )	259	260	261	262	263	264	265
	266	267	268	269	270	271	272
Street:	273	274	275	276	277	278	279
	280	281	282	283	284	285	286
City:	287	288	289	290	291	292	293
	294	295	296	297	298	299	300
State: Zip:	301	302	303	304	305	306	307
	308	309	310	311	312	313	314

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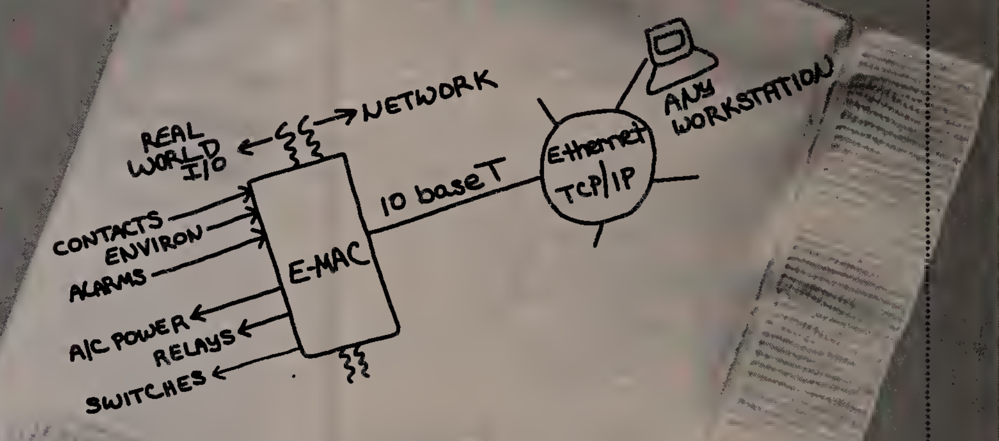

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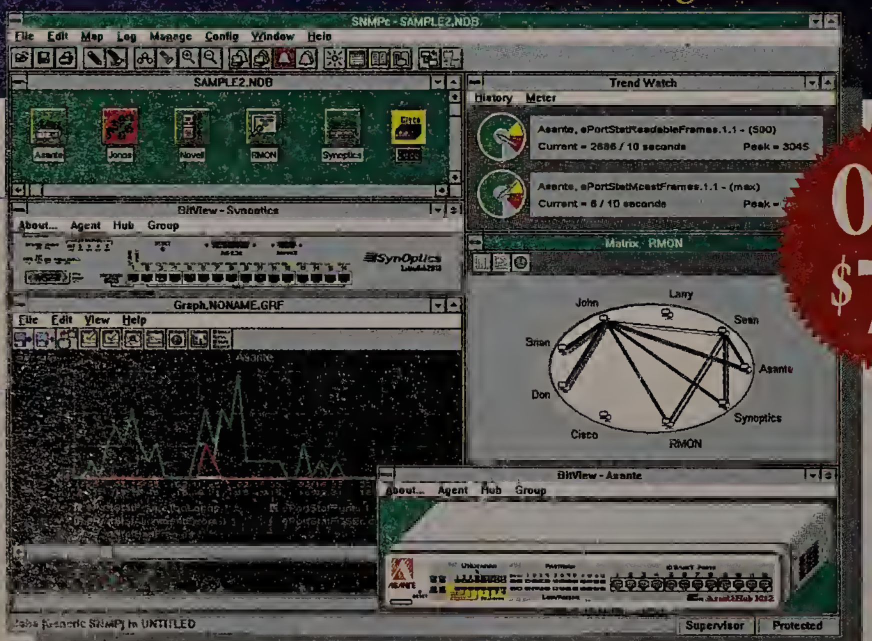

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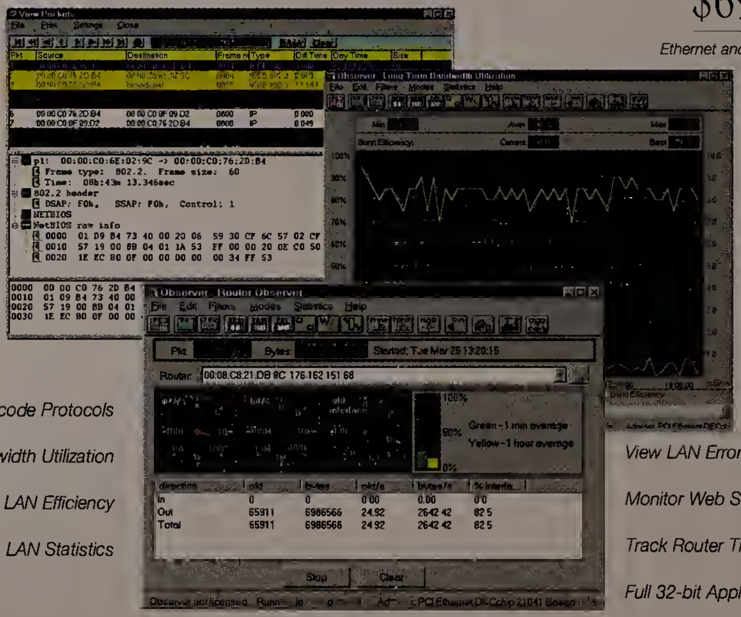
Observer - Router Observer
File Edit Filters Modes Statistics Help
Started: Tue Mar 25 13:20:15
Router: 00:08.C8:21.DB 8C 176.162 151 68
Green - 1 min average
Yellow - 1 hour average
Stop
Clear

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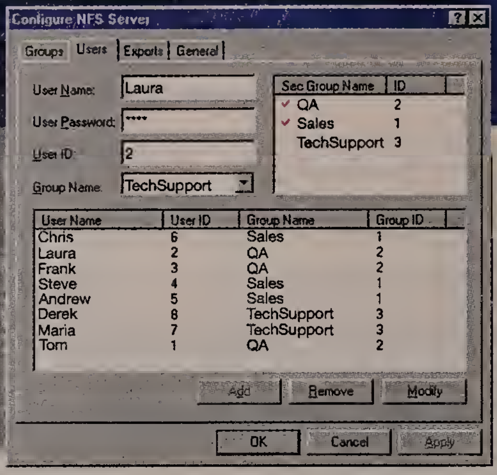

Configure NFS Server

User Name: Laura
User Password: ****
User ID: 2
Group Name: TechSupport

	Sec Group Name	ID
✓	QA	2
✓	Sales	1
	TechSupport	3

User Name	User ID	Group Name	Group ID
Chris	6	Sales	1
Laura	2	QA	2
Frank	3	QA	2
Steve	4	Sales	1
Andrew	5	Sales	1
Derek	8	TechSupport	3
Maria	7	TechSupport	3
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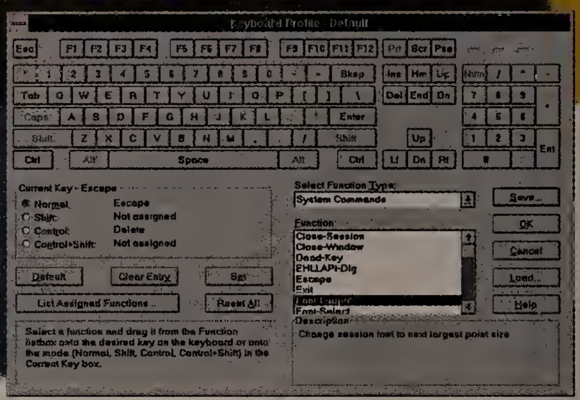

Keyboard Profile - Default

Current Key - Escape
● Normal: Escape
○ Shift: Not assigned
○ Control: Delete
○ Control+Shift: Not assigned

Select Function Type: System Commands

Function: Close-Session, Close-Window, Dead-Key, EHLLAPI-Dlg, Escape, Exit, Font-Enlarge, Font-Select

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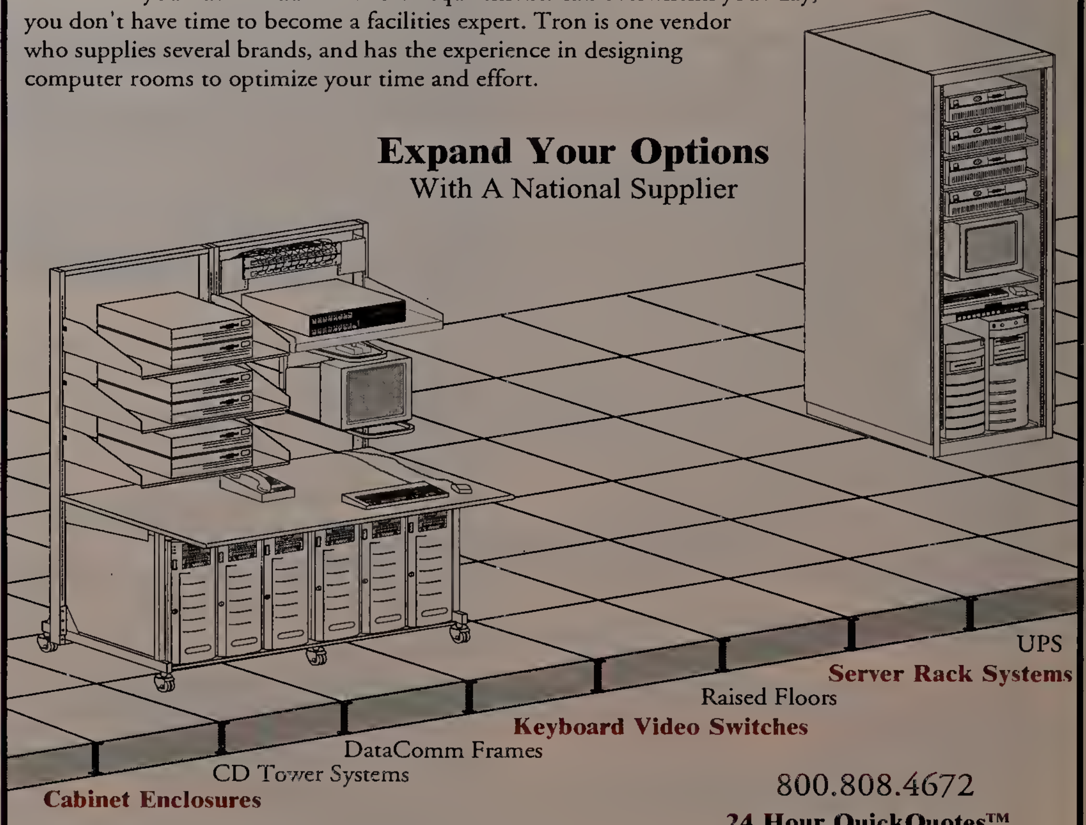

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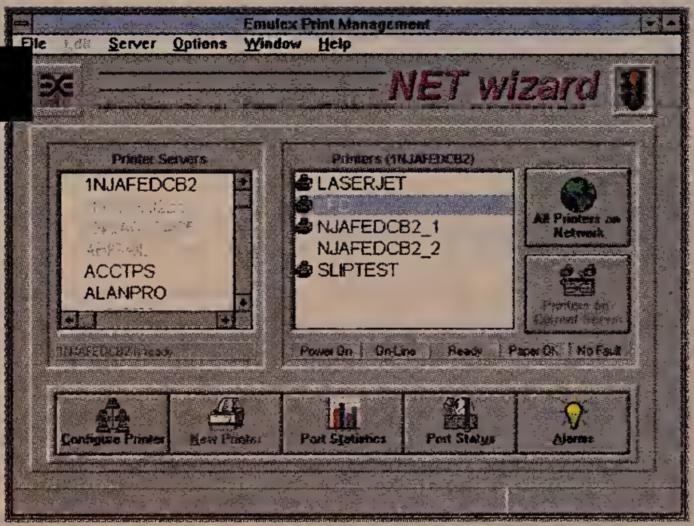

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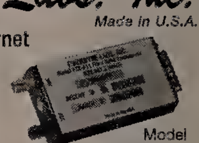

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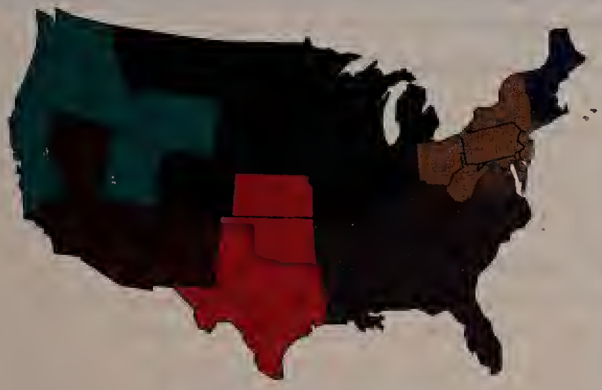

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Software services key to new Catalyst switch

By Jim Duffy
San Jose, Calif

Key to the new Catalyst switches Cisco Systems, Inc. last week rolled out is the software that allows them to deliver services, such as policy management and security, for corporate networks.

As expected, Cisco unveiled the 13-slot Catalyst 5500 LAN/ATM switch, two-slot Catalyst 5002 and new modules for the existing five-slot Catalyst 5000 (*NW,* April 7, page 6).

One of the new modules is a routing blade that features high-speed caching for Layer 3 switching.

Catalyst 5500 *features switch software.*

But instead of the new hardware, the switch software provides the value behind the new products, analysts said. Version 2.2 of Catalyst 5XXX software, part of Cisco's Internetwork Operating System suite, features redundancy, multimedia support, security, mobility, quality of service (QoS) and policy-based management.

For reliability, Catalyst 2.2 allows users to equip the 5000 line with redundant supervisor modules for device link-level fault tolerance, the Spanning Tree Algorithm for link- and path-level redundancy, Fast EtherChannel for load sharing, and protocols for ATM LAN Emulation and routing resiliency.

For multimedia support, the switch software features the Internet Group Multicast Protocol and the Cisco Group Multicast Protocol.

These protocols enable routers and switches to request participation in specific multicast groups for videoconferences and other multimedia applications.

Users also now can increase switch security with Catalyst 2.2's support for the Terminal Access Controller Access Control System authentication services and Syslog audit trails. The software also allows users to establish access filters for media access control and network layer addresses.

Lastly, a new release of CiscoWorks for Switched Internetworks (CWSI) management software allows managers to establish user policies for bandwidth, topology, addressing, security and QoS levels.

Catalyst 2.2 is available now and ships with all Catalyst 5000 switches. CWSI 1.3 is also available and costs $7,995 for Unix and $6,995 for Windows NT.

In addition, one of the Catalyst 5000 line's most important new hardware features is a Route Switch module with NetFlow Switching.

Up to now, NetFlow has been a caching technique for boosting the internal performance of routers.

By extending NetFlow to switches, the Catalyst devices can now cache Layer 3 flow information to zip packets through switches while avoiding router hops, Cisco said.

NetFlow will allow the Route Switch module to operate at several million packets per second, according to officials at Cisco. ■

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Catalyst 5002 system	$1,295	Now
Supervisor Engine II TX	$9,995	Now
ATM Switch Processor and Feature Card	$15,000	Now
100M bit/sec Group Switching modules	$5,995	Now
NetFlow Route Switch Module	To be announced	Summer '97

Cisco

Continued from page 1

deliverables of Cisco's recently announced enterprisewide security initiative, a program endorsed by Hewlett-Packard Co., Microsoft Corp. and Oracle Corp. to provide end-to-end network security across heterogeneous environments (*NW,* March 17, page 17). Cisco confirmed it will roll out security servers this week.

Users said the products will enable them to open up their networks a little more, now that they can verify who is attempting access.

"We're in the midst of enhancing our remote access system, trying to upgrade that capability to where we can allow our users access to our local area network," said Tom Parsons, manager of network design at financial services giant USAA in San Antonio, Texas. "Right now, all they've got is access to some text-based electronic mail."

CiscoSecure ACS 2.0, along with Security Dynamics Technologies, Inc.'s SecureID server, will provide USAA with dual authentication for access to sensitive data on the LAN, according to Parsons.

CiscoSecure ACS 2.0 integrates token-card authentication, a multiuser Web-based Java graphical user interface (GUI) and database support for the storage of user and group profile information.

The product authenticates users and determines which internal networks and services they may access.

CiscoSecure ACS 2.0 supports token cards from CryptoCard, Inc., Secure Computing Corp. and Security Dynamics. Token cards are the most popular method for keeping unauthorized users from accessing proprietary information.

The Java-based GUI on CiscoSecure ACS 2.0 is intended to simplify server administration and enable multiple system administrators to simultaneously manage security services from multiple locations. The GUI supports Microsoft and Netscape Communications Corp. Web browsers, and the Secure Sockets Layer standard for communication between the GUI and the server.

CiscoSecure ACS 2.0 also now supports relational databases from Sybase, Inc. and Oracle. These distributed databases will help provide scalability and redundancy for storage and management of user and group profile information, sources said.

CiscoSecure EasyACS is designed to deliver basic security functions to branch office and start-up Internet service provider environments.

It is an entry-level access control server that uses an NT user database or an EasyACS database file to store authentication profiles.

CiscoSecure ACS 2.0 is immediately available at a list price of $3,000. CiscoSecure EasyACS will be generally available with all Cisco dial access servers in May at no additional charge. ■

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3) Have multiplatform networks installed or planned (including network architectures, LAN operating systems and LAN environments).

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IBM pumps up server with more power, manageability

By Michael Cooney
Somers, N.Y.

IBM last week revamped its RISC System/6000 family in an effort to improve Internet server speed and improve its software features.

The company announced a variety of new hardware products but specifically highlighted the RS/6000 Model F50, which it claims sets a new performance record for Unix-based Internet servers.

"With this announcement we are giving users more power to conduct business over the Internet while improving their ability to manage servers in that environment," said Tim Dougherty, program director of network solutions for IBM.

For power, the symmetric multiprocessing (SMP) Model F50 is a four-processor, 166-MHz PowerPC-based server with nine slots and 22 bays that can support any configuration of Ethernet, ISDN, ATM or SNA Synchronous Data Link Control adapters.

IBM claims the F50, which is targeted at the Web server market, achieved 2,148 HTTP operations per second in SPECweb96 benchmark testing, surpassing Hewlett-Packard Co.'s 9000 Model k460 four-way SMP box record of 2,114 HTTP performance. SPECweb96 is an industry standard way of measuring Web server performance.

IBM's other RS/6000 servers, such as the E20 and F30, had their power tweaked with a new 233-MHz PowerPC processor add-in board. The new board improves overall system performance by as much as 50%, Dougherty said.

On the software side, IBM expanded its line of PowerSolutions integrated software offerings with a new package that includes a Lotus Development Corp. Domino server; AIX 4.2; "Business in a Box," which features some 20 integrated business applications; Netscape Communications Corp.'s Calendar Server; and IBM's Firewall, Internet Connection Server and Net Commerce packages.

Available to run on any of the RS/6000 servers, the new PowerSolutions package will let users easily set up a Web server capable of supporting Web publishing, E-mail, workgroup collaboration, electronic commerce and security, Dougherty claimed.

For managing the RS/6000 SMP environment, IBM announced its Tivoli TME 10 NetView for AIX management platform can now monitor and control any RS/6000 clusters running High Availability Cluster Multi-Processing (HACMP) software. HACMP is the software that ties together RS/6000 clusters and ensures failover protection.

The RS/6000 Model F50 will be available April 25 for $28,900. Models J50 and R50 will also be available this month at prices starting at $54,000 and $64,000, respectively. ■

Service

Continued from page 1

carriers are prepping a service to report the information the customer needs to easily monitor carrier compliance with SLAs. Using software from Visual Networks, Inc., carriers will extract the data that measures the key factors customers have insisted upon in their SLAs. That data, such as delay and packet loss, is often difficult, if not impossible, to gather.

Sprint Corp. will turn up the SLA service as soon as it can after Visual Networks delivers the software sometime in December.

AT&T and MCI Communications Corp. are working with Visual Networks to develop the software. Visual Networks plans to include custom service-level templates for each carrier that will present the data to verify whether the frame relay service meets the SLA.

MCI said it was evaluating the gear, and AT&T said it was not prepared to announce a service. Other carriers are close to unveiling similar services, said Lynn Nye, president of the NetResults consultancy in Portland, Ore., but he could not reveal which carriers.

A BETTER VIEW

Interexchange carriers will let users peer into their frame relay networks to monitor performance.

▶ **Typical current view (monthly reports):**

- Packets sent, received and discarded
- Ingress and egress sessions

▶ **Enhanced view:**

- Round-trip response time, time-of-day performance, peak utilization and protocol analysis

The SLA verification service relies on Visual Networks DSUs/CSUs and software being installed at each node of the frame relay network. The gear collects data about frame relay traffic, stores it and periodically dumps it to a centralized workstation.

The SLA templates are part of the final stage of a three-phase rollout of Visual Networks reporting tools that will be completed by year-end, according to Robert Markovich, vice president of marketing for the company.

The reporting tools are designed for chief information officers. The tools initially track error per line and per port, track congestion per permanent virtual circuit, rank ports and PVCs from least to most active, and analyze network load.

Second-phase tools, which will be available in September, will track data delivery rate and delay per PVC, availability for line and port, and rank PVCs, lines and ports by frequency of problems.

The December rollout of the SLA templates will also add the capacity to generate customized SLA reports.

As of last fall, Sprint has been regularly installing the Visual Networks gear when it installs frame relay circuits. Users can buy access to the data now, but it is not sorted to map directly to an SLA.

Wheat, First, Butcher, Singer, a stock brokerage in Richmond, Va., wanted that information so badly, the firm bought the Visual Networks gear and installed it in its 120-node frame relay network that is supported by AT&T.

"It's a real problem, ensuring a vendor gives you what you want, unless you have an automated system," said Roger Hall, data communications operations manager at Wheat, First, Butcher, Singer.

But with the day-to-day operation of his network to worry about, there is not enough time to gather all the information he would need to verify the SLA, Hall said.

Some users opt not to buy their own gear but instead pay the service provider for a glimpse. To verify the data is accurate, the user can periodically ping the net between routers, said Jim McWalters, Sprint group manager for frame relay.

Sprint installs Visual Networks gear routinely, despite customer preference, because the gear gives Sprint a better sense of network status, McWalters said. ■

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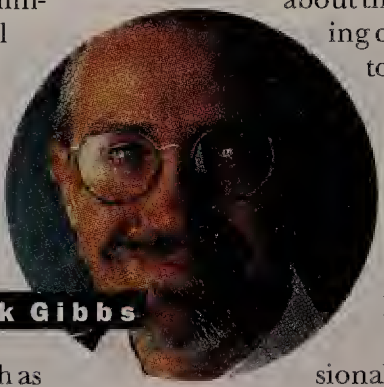
Backspin

Cigars and cyberspace: Musing on the terrace at 1 a.m.

I gave up smoking some 18 years ago, so it was much to my surprise when I recently discovered I liked cigars. I have embarked on a slow tasting of different brands to find which stogies suit my palate.


Mark Gibbs

These samplings usually take place at about 1 a.m. on the terrace behind our house. So it was there, just 20 minutes ago while I sampled a Paul Garmirian (quite excellent) that I came upon the topic for this week's column (puffing a cigar sure puts me in a contemplative mood).

Our house is on the side of a hill overlooking the Oxnard plain and the east end of Ventura. On a clear night, such as tonight, the view is breathtaking. It was as I contemplated the panorama, cigar in hand, that I started wondering what cyberspace might look like.

If you have kept up with the cyberpunk subgenre, you will have read *Neuromancer, Count Zero* and other novels by William Gibson, who is reputed to have coined the term "cyberspace," which he describes in the most general way. Also writing in this genre is Neal Stephenson, who wrote *Snow Crash* and provides his own spin on the texture of the virtual computer universe.

> *A poorly designed virtual world is, at best, a bore and at worst, an irritating, confusing mess.*

Their visions are entertaining but really are only devices for the purposes of their stories rather than detailed descriptions of how cyberspace operates. To be honest, Stephenson goes a little further in describing how events that define and control cyberspace are implemented and operate, but it's still sketchy. That attribute is probably what makes both authors' work so appealing — you get to fill in the technological blanks in what are excellent stories.

The problem of what cyberspace is like is actually quite important. If you've ever tried designing worlds using Virtual Reality Modeling Language, you'll know it is quite hard to create a consistent, interesting virtual environment if it is of more than trivial size.

Sure, you can do all sorts of cute stuff. You can have gravity inverted, walls textured with moving gold waves, and objects of impossible size floating in midair, if you wish. But while that's neat, far-out, cute or whatever, if there isn't an architecture to the world — a set of rules and themes that provide shape and continuity to the environment — there's nothing compelling about the experience. If there's nothing compelling, no one will want to visit.

A poorly designed virtual world is, at best, a bore and, at worst, an irritating, confusing mess. So some questions spring to mind on the topic of the attributes and logic of cyberspace:

1. Is cyberspace two-dimensional, three-dimensional or what?

2. What rules govern the relationship between computers in cyberspace? Is their spatial relationship defined by the time it takes to send a data packet from one computer to another or by something else?

3. Is a mainframe virtually bigger than a PC in the virtual world? If not, why not? What defines the apparent size of machines?

4. What do computers actually look like in cyberspace? Is their shape defined arbitrarily by their owners, or should rules govern their appearance?

5. If the laws of physics apply to the virtual world, how and why? If not, why not?

6. If the laws of virtual physics are locally defined on the server you access, should they be inviolate, or should there be gradations of user "power" (rather like Dungeons and Dragons) that allow you to modify and manipulate the world?

7. Should your avatar have fixed limitations? If so, do those limitations include allowing you to be virtually killed? For how long are you dead?

8. Should there be a virtual police force? What powers should it have, if any?

9. How should you move in cyberspace? Should you be able to jump from location to location, or should you be constrained to a maximum speed?

10. And finally, in cyberspace, will I be able to sit on my virtual terrace and smoke my virtual cigar? Will I enjoy it?

Let me know your thoughts on the nature of cyberspace at nwcolumn@gibbs.com (a T-shirt for the best answer). Or tell me how to get there by phoning (800) 622-1108, Ext. 504 (no prizes via phone). Beam me up quick, Scotty. I put on a red uniform by mistake! Argghhh!

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

THE POETRY OF START-UPS

Bright Tiger Technologies' *Larry Moore*

Tiger Tiger, burning bright,
In the forests of the night,
What immortal hand or eye,
Could frame thy fearful symmetry?

Heavy stuff. But we didn't write it. "The Tiger" was penned by **William Blake,** the Romantic English poet who probably never expected his work to provide inspiration for the name of an Internet start-up.

It did, though. The company is **Bright Tiger Technologies,** founded last year as **TigerEye Technologies.** Besides having a new name, the company has a new president and CEO.

Larry Moore, the development and marketing guru who oversaw the introduction of Lotus Notes, began work last week at Bright Tiger, located in Acton, Mass.

He leaves **Lotus Development Corp.** after more than a decade in a variety of positions, most recently as senior vice president of the Emerging Products Group.

So what lured Moore from the heady corridors of corporate power to the risky world of Internet start-ups? The opportunity to acquire valuable new skills, of course.

"I spent [my first day] learning how to make coffee. I actually have to grind beans now," he said.

That accomplishment behind him, Moore is focusing on guiding Bright Tiger's development team as it works on tools designed to allow organizations to build and control next-generation Web server environments.

Moore said the company plans to release a product in the fall, though he politely declined to provide any details. However, someone must have blabbed something to **North Bridge Venture Partners** and **Accel Partners,** because the two firms recently gave Bright Tiger $4.4 million in venture funding.

Bright Tiger was founded by **Jim Hourihan,** a former marketing vice president at **Wellfleet/Bay Networks, Inc.,** and a group of engineers from **Iris Associates, Inc.,** a Lotus subsidiary.

SECOND CUP OF JAVA The venture capital firms that provided first-round financing to **Active Software, Inc.** must like what they see: They've combined to give the Santa Clara, Calif.-based message brokering vendor another $7 million.

Enterprise Partners, Sierra Ventures and the **Kleiner Perkins Caufield & Byers** Java Fund were joined in this round of financing by new Active Software investors **Lehman Brothers** and **Robertson, Stephens & Co.**

Active is the first start-up to receive second-round financing from the Java Fund, company officials said. Its flagship product, ActiveWeb, is designed to enable communications across dissimilar networks, intranets and the Intranet.

WHO YA GONNA CALL? We've all been there. Your Internet or intranet connection isn't working, and you just can't figure out what the problem is.

Oh sure, you could call in the understaffed, overworked IS folks. They'll be happy to get to your little problem — sometime in the next millennium.

Now **VitalSigns Software, Inc.** of Santa Clara, Calif., has released a product the company says can be your personal Web doctor.

Net.Medic is a browser companion designed for end users to monitor, isolate, diagnose and correct Internet performance problems. Company officials say Net.Medic can determine the source of slow response times from Web sites, recommend solutions and sometimes even fix the problem.

VitalSigns reportedly is working on a version of Net.Medic that scowls at you and mutters to itself.

Net.Medic runs on Microsoft Corp.'s Windows 95 and NT, Netscape Communications Corp.'s Navigator 3.0 and above, and Microsoft Internet Explorer 3.0 and above. It costs $49.95 and can be downloaded from the VitalSigns Web site (www.vitalsigns.com) for a free 30-day trial.

You need not wax poetic to contribute your best Internet and intranet news to 'Net Buzz. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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